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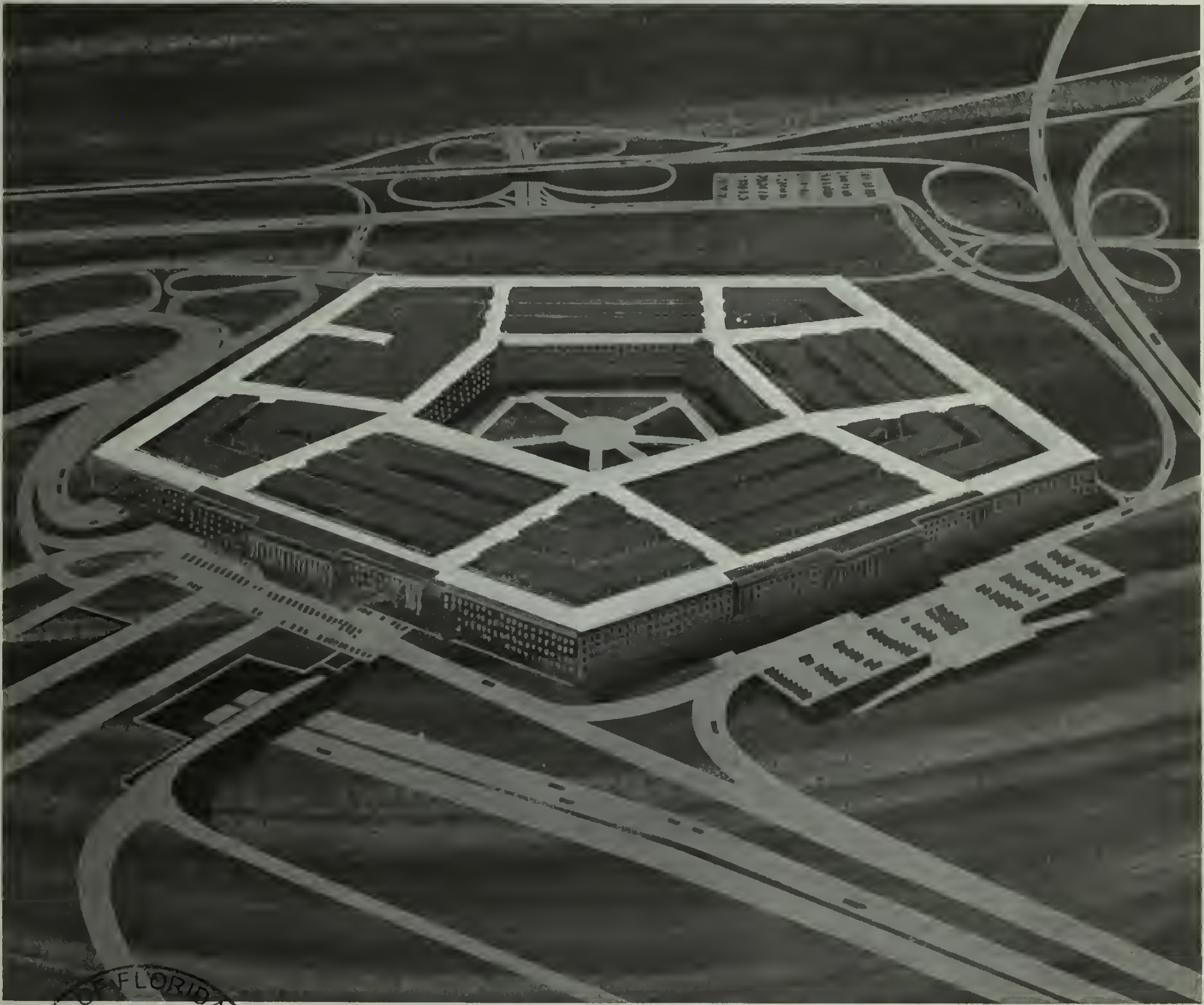

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IN THIS ISSUE

FEATURES

Concept Formulation and Contract Definition
Robert G. Alexander ---- 1

The Technological War: Problems and Challenges
Colonel George T. Buck, USAF ---- 5

The New Face of Contract Administration
Captain I. G. Cockroft, USN ---- 10

The Technical Information Exchange ---- 13

Project THEMIS ---- 27

New Suppliers Sought by Defense Supply Agency ---- 28

DEPARTMENTS

About People ---- 9

Meetings and Symposia ---- 17

Calendar of Events ---- 20

From the Speakers Rostrum ---- 21

Bibliography ---- 32

Defense Procurement ---- 33

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The purpose of the *Bulletin* is to serve as a means of communication between the Department of Defense (DOD) and its authorized agencies and defense contractors and other business interests. It will serve as a guide to industry concerning official policies, programs and projects, and will seek to stimulate thought by members of the defense-industry team in solving the problems that may arise in fulfilling the requirements of the DOD.

Material in the *Bulletin* is selected to supply pertinent unclassified data of interest to the business community. Suggestions from industry representatives for topics to be covered in future issues should be forwarded to the Business & Labor Division.

The *Bulletin* is distributed without charge each month to representatives of industry and to agencies of the Department of Defense, Army, Navy and Air Force. Requests for copies should be addressed to the Business & Labor Division, OASD(PA), Room 1E764, The Pentagon, Washington, D.C. 20301, telephone, (202) OXford 5-2709.

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DEFENSE INDUSTRY
BULLETIN

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Concept Formulation and Contract Definition

Robert G. Alexander

Concept formulation is the first of two periods in the contract definition planning process (Figure 1). It is concerned with establishing the concept and accomplishing the prerequisites to engineering and operational systems development.

Concept formulation is not a formal step. Rather, it describes the activities preceding contract definition. These activities include the experimental tests, engineering, and analytical studies conducted under exploratory and advanced development. They provide the technical, economic and military bases for the development of an item or system. Concept formulation includes those activities that directly lead to, or support a project. It ends with action by a technical committee establishing the development project.

Six Prerequisites of Concept Formulation

When evidence exists that the prerequisites of concept formulation, as specified in DOD Directive 3200.9, have been satisfied and is presented, it must provide a firm basis for the key decision by the Secretary of Defense to grant conditional approval to enter engineering. Incidentally, as one progresses through these prerequisites, it becomes aparent that the Army Materiel Command (AMC) cannot accomplish all of them alone—that the Combat Developments Command, the Continental Army Command, and the Department of the Army Staff will necessarily have to be participants.

A critical prerequisite is that of demonstrating that the mission and performance envelopes have been defined. The mission objectives must be specifically described, the operational concept and the logistic concepts defined, and the item or system performance requirements specified to include reliability and maintainability. This prerequisite is intended to demonstrate that the system will meet a valid mission or current operational objective.

It then must be demonstrated that the best technical approaches have been selected, based on a parametric analysis of possible alternatives. For example, if an armored reconnaissance scout vehicle for jungle warfare is required, the best technical approaches might be a tracked vehicle, a wheeled vehicle, or a ground effects machine. In selecting one of these vehicles, its technical superiority must be demonstrated.

Robert G. Alexander is Chief of the Program Support Branch in the Development Directorate, U.S. Army Material Command, Washington, D.C. He has been in government service since 1946 and, before coming to AMC headquarters in 1964, he held assignments in the research and development field at the U.S. Army Mobility Command and the U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va.

A third prerequisite is to demonstrate that primary engineering rather than experimental effort is required, and that the technology needed is sufficiently in hand. This is a point of major importance. Fundamentally, the degree of advancement depends on the level of confidence in the probability of successful development which must be supported by, at least, a laboratory demonstration.

The fourth prerequisite assures that a thorough trade-off analysis has been made. The primary goal of this analysis is to achieve an optimum balance among operational effectiveness, schedule and cost, based on differing alternatives within the system.

A favorable cost effectiveness must be determined for the proposed item in relation to the cost effectiveness of competing items on a DOD-wide basis. This effort analyzes the total cost of the system, including development, production, and operation and maintenance costs. The item is compared with systems in other Military Departments to prevent unwarranted expenditures and "re-invention of the wheel."

Finally, it must be demonstrated that cost and schedule estimates are credible and acceptable. These estimates are for the total life cycle of the system.

Although it is a major task to demonstrate that these prerequisites have been met for a proposed development project, it should be emphasized that the decision to give conditional approval for development also implies that it will be produced and deployed. The Army Materiel Command requires that concept formulation be completed for all projects, with the approval of the concept formulation package stratified at different levels depending on the total dollar investment involved. The commanders of AMC major subordinate commands are authorized to approve the concept formulation for projects with dollar investment below $50 million. Others are submitted to Headquarters, AMC, or to the Department of the Army.

Conditional Approval To Proceed

Let us now examine how the conditional approval to proceed with development occurs. First, for all major projects, a Program Change Request (PCR) and an early Technical Development Plan (TDP) are submitted, through the Department of the Army, to the Office of the Secretary of Defense. The project is then introduced into the Five Year Defense Program. An engineering development request follows with an up-to-date Technical Development Plan, a plan for contract definition, and a report on the status of meeting the six prerequisites just discussed.

With completion of these steps, the request to enter contract definition is signed by the Secretary of Defense, indicating that engineering development is conditionally approved.

Contract Definition

Contract definition is the second period in the definition planning process (Figure 1), but the first step in engineering development. It is a formal step during which preliminary design and engineering are verified or accomplished, and firm contract and management planning are performed. Normally accomplished by two or more competing contractors, the primary result of contract definition is a key decision—approval before full-scale development can be initiated.

Full-scale development is devoted to the engineering and testing of an end item or system actually intended for service use, and follows contract definition whenever that step is required. DOD Directive 3200.9 specifies that contract definition will be required for those major projects with estimated research, development, test and evaluation (RDT&E) funding above $25 million or a production investment of $100 million. DOD or Department of the Army may designate other projects for this detailed planning process.

Contract definition is directed toward these goals: the ratification of approval for full scale development and the definition of the development contract (Figure 2). It is conducted in three phases:

- **Phase A.** The proposals for the conduct of contract definition are solicited, received and evaluated, and two or more competing contractors are selected.
- **Phase B.** The contract definition tasks are accomplished by competing contractors.
- **Phase C.** Contractor proposals for full-scale development are evaluated, the development contractor is selected, and the contract is negotiated.

These phases will be discussed in more detail later.

Contract definition ends with the ratification of the conditional approval for development.

Development and Production

Terminology of the remaining activities are development and production. These activities are very much affected by decisions made during the definition planning process. The contract negotiated following contract definition was traditionally for development only. In some cases within DOD, the production decision has been made concurrently with the ratification of the development decision at the end of contract definition. In the case of the Air Force C-5A troop and cargo aircraft, the development contract also included initial production quantities and logistic support of the aircraft. The Army has yet to use this "Total Package Procurement" on any projects above the DOD threshold (RDT&E $25 million or $100 million production investment). A quasi-total-package-procurement approach has been used on the Advanced Aerial Fire Support System which includes a production option.

Why Concept Formulation and Contract Definition?

Among the results expected from concept formulation and contract definition are significant savings in total operational system costs. The

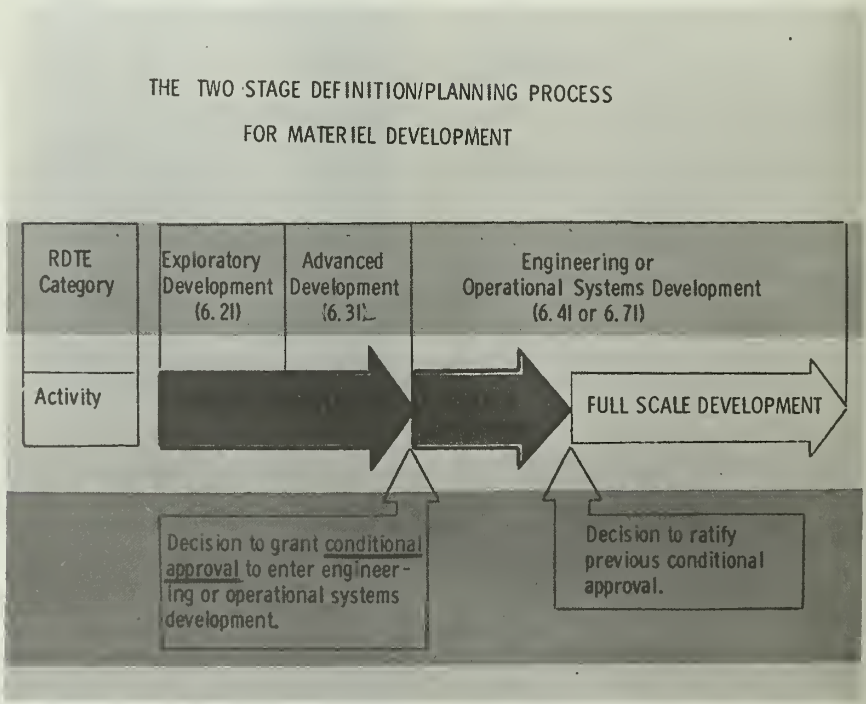

THE TWO STAGE DEFINITION/PLANNING PROCESS
FOR MATERIEL DEVELOPMENT
RDTE Category
Exploratory Development (6.21)
Advanced Development (6.31)
Engineering or Operational Systems Development (6.41 or 6.71)
Activity
FULL SCALE DEVELOPMENT
Decision to grant conditional approval to enter engineering or operational systems development.
Decision to ratify previous conditional approval.

Figure 1.

substantial cost overruns that have historically plagued development projects are expected to be controlled in three ways. First, savings are expected by defining more precisely what is required. By this we mean that the Government must prepare system performance specifications during concept formulation, and that the contractors typically will develop detailed definition of both system and subsystem performance specifications during contract definition.

Second, costs will be controlled by employing fixed-price and fixed-price incentive contracts for development. Third, savings will accrue by closer attention to life-cycle cost considerations and the trade-offs between development, production, and maintenance and operation costs. Historically, little attention was paid during development to the impact of design decisions on production and operating costs. This impact is a major concern of contract definition, and substantial savings are expected to result.

Next, substantially fewer engineering changes will result due to better definition of system hardware and support items and their interfaces. Then, too, fewer program redirections and cancellations are expected to occur, because the technology required will have been demonstrated as being in-hand, *i.e.*, not dependent on scientific breakthroughs, and because better control of development projects will lessen the disturbing effects of reprogramming on the entire DOD weapons acquisition process. Finally, there will be greater force structure effectiveness through emphasis on system effectiveness in meeting mission objectives, and on cost-effectiveness analysis of competing systems to assure that funds will be committed where they will make the greatest contribution to achievement of the overall DOD posture.

Phases of Contract Definition

With this brief overview, let's examine the conduct of Phases A, B and C of contract definition in more detail.

Phase A. In Phase A, a request for proposal (RFP) for the conduct of contract definition on a competitive basis is released to industry by the Government. Contractors then submit two proposals which are a firm fixed-price proposal for contract definition, and a planning proposal for engineering development, plus projections for production, operation and maintenance costs of the system.

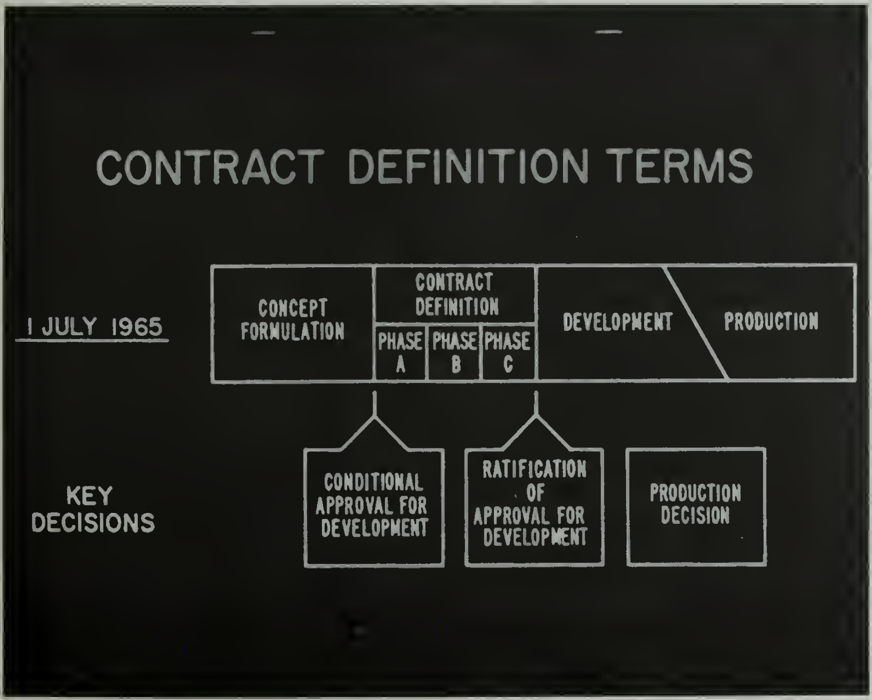


Figure 2.

Following the evaluation of the proposals, contractors are selected by the source selection authority. Usually, two or more contractors are selected to compete during the next phase. Firm fixed-price contracts for Phase B are then negotiated with each selected contractor.

Phase B. Moving on from the point of Phase B contract award, one should examine the outputs expected. The first output is a complete technical, cost and management proposal for development. In some cases, proposals can also include a portion of the production and logistics support procurement. A second output is the contract definition report which summarizes contractor activities and their results. This report supports the proposal for full-scale development. It can be quite extensive for the larger projects.

Next, let's examine some of the activities of the contractor under Phase B which lead to the two major outputs just mentioned. The first action is emphasizing intra-system trade-offs that will optimize operational effectiveness, total life-cycle costs, and project schedules. Second, performance specifications should be established which will permit design latitude of end items of the system during development within specified reliability and maintainability, and spell out minimum acceptable performance levels to guarantee the desired performance.

Third, the technical plan should identify risk areas and the plans for overcoming them, Also, the detailed work statements for the development contract should be submitted in formal contract language. Fourth, the management plan should include project organization, make-or-buy policy, subcontracting, and project control, as well as government-furnished equipment control methods. Fifth, detailed cost estimates should be based on the work breakdown structure and its derivative packages. Finally, the contractor should structure a fixed-price or incentive contract in which incentives should be established for items of high value to the Government, and should reflect system effectiveness and life-cycle cost considerations.

The foregoing discussion has emphasized the activities of competing industrial contractors during Phase B. During this period, the Government provides equal guidance to all contractors and continues in-house tasks, such as revising and detailing the Technical Development Plan.

Phase C. Having completed Phase B, we now move to the next phase and examine the key steps accomplished in Phase C. Proposals are evaluated by the Source Selection Evaluation Board, within a goal of 18 weeks. Results are evaluated by a high level Source Selection Advisory Council, and alternatives are submitted to the source selection authority for decision.

Technical transfusion may be conducted to the extent of the Government's rights-in-data after the source selection has been made. Thus far, however, few items have been transfused due to "real life problems" which will be discussed later.

Changes are incorporated in proposals and the cost of these changes are negotiated with the winning contractor. If approved by the source selection authority, the contract for full-scale development is negotiated and executed. In certain cases, still other actions may be directed. These could include: select an alternate source, *i.e.*, a source other than those contractors competing in the Phase B activity; defer or abandon the development effort; or perform further definition or return to advanced development.

Actually, no Army program has yet followed this formal cycle just described in every respect. This is as it should be because of the very nature of research and development. The cycle must be sufficiently flexible to accommodate deviations which are necessitated by changes in requirements, major breakthroughs in the state of the art, and changes in urgency.

Many Ways of Doing Business with Industry

There have been numerous ways of doing business with industry in the development of materiel including the use of many different types of contracts.

Normal Contract Definition. Normal contract definition has been a real advance in the integrated planning for associated equipment, logistic and maintenance support, and personnel implications involved in the engineering of large systems. The advantages are:

- Good basis for competitive total package procurement.
- Good total price expected to result due to competition.
- Comprehensive planning.
- Design data derived during contract definition by competing contractors belongs to the Government.
- Better visibility provided by the comprehensive planning.
- Pure performance specifications permitting latitude for contractor action.

Total Package Procurement. Total package procurement (to include development, production and logistic support) combined with contract definition offers interesting possibilities in our continuing effort to get the most for the defense dollar. However, both contract definition and total package procurement have some inherent problems. Lack of enthusiastic response from industry was recently encountered when bids were requested involving both contract definition and total package procurement. Contractors were reluctant to commit their companies' resources for a period of five to seven years based on just paper studies.

Although pure performance specifications are emphasized as an output of contract definition, in reality contractors have found that detailed designs must be completed in order to prepare the required production, operation and maintenance cost estimates with a degree of accuracy sufficient to warrant the risk of their stockholders' investments. These detailed designs are not readily transfused and, consequently, we have not yet fully developed technical transfusion.

Expanded Contract Definition. Expanded contract definition, to include the fabrication and test of two parallel hardware approaches, provides some merit in overcoming the objections to the usual contract definition process. It is anticipated that industry will be less reluctant to commit its resources when it can more nearly see what its costs are. Over-concern on the part of industry with the risks of detailed design on paper only can then be somewhat overcome by more credible information resulting from actual test of hardware. Fabrication of prototypes can reduce risks, both for industry and the Government, before large commitments are made. Expanded contract definition, to provide for hardware fabrication and test, does cost more during development and requires more time. The added cost and time should be weighed against the benefits that competitive hardware development would provide.

Traditional Methods. Previous traditional development methods are not nearly so attractive as contract definition, although they do permit a better opportunity for the small contractor with limited system capabilities to compete in the development process. Principal disadvantages are: total package procurement is not always feasible; traditional methods lead to probable sole source procurement of first-year production, thus resulting in additional costs to the Government; and, finally, the Government accepts high cost risks through assuming total interface responsibility. Sole source should be resorted to only in those cases where pressing necessity requires such drastic and inevitably expensive means.

On selected development projects, AMC has proposed that the contract definition procedure be supplemented to add fabrication of prototype hardware and engineering design tests within the contract definition phase—to be followed by total package procurement. This would have the effect of extending the competitive period of contract definition into the initial stages of full-scale development. The additional development costs this will entail may well be justifiable in that it offers a better chance of assuring wider industry participation, of selecting the right approach, the best contractor, and a more credible cost for successful development.

Foreign Military Sales Pamphlet Available

A DOD pamphlet titled, "Foreign Military Sales Facts," which highlights the background of the Military Export Sales Program as well as details of some of the larger sales arrangements, is available without charge.

Requests for copies should be addressed to: Office of the Assistant Secretary of Defense (International Security Affairs), Attn: ILN, Room 4B 652, Washington, D.C. 20301.

The Technological War: Problems and Challenges

Superiority in Technology is Goal of Air Force Missile Development Center

Colonel George T. Buck, USAF

THE mosting startling thing about today's technology is the increased change of pace. It has been estimated that more than 50 percent of our current scientific knowledge was acquired in the last 20 years. The Air Force Missile Development Center (AFMDC), at Holloman AFB, N.M., is the scene of some of the most diverse research, development and test activities of the Air Force Systems Command (AFSC). A dynamic turnover of events is continually being experienced at this southern New Mexico military installation.

This is best illustrated by reviewing the mission activities of a typical day at the center. One single day finds armament crews readying aircraft with varying munitions loads. Recently, these could have been 750-pound bombs hung beneath one of the latest versions of the Phantom aircraft, the F-4D, or 2000 pounders clinging to a F-105. Soon, the armament crews will be working with the F-4 again, this time in tests of the Walleye missile. Then, the F-105 returns for tests of the Standard ARM missile.

On the same day a solid propulsion crew at the test track facility makes final checks on the big rocket boosters to drive the F-111 module down the famous Holloman 35,588-foot test track. This test is one of a series to determine the reliability of the aircrew escape system for one of the nation's modern aircraft—the F-111.

Some 50 miles south of Holloman, on the firing line at the U.S. Army's White Sands Missile Range (WSMR), another Holloman crew readies a rocket probe for launch. The crews annually launch over 100 rockets of many designs supporting the Air Force, Navy, Army and the National Aeronautics and Space Administration (NASA).

In the not too distant past, one of the most unusual aspects of the center's work proceeded on the flight line. There French and German accents mingled with southwestern drawls as an international crew readied the French-built, Swiss-owned Mirage III aircraft for flight tests over the

Lending an international note to the activities of the Air Force Missile Development Center was a group of Swiss aviators busy testing the Mirage III, a French-built, Swiss-owned aircraft. The aircraft was being married to a U.S.-developed fire control system. Tests at the center were conducted for over two years.

WSMR. The international crew operated at Holloman for almost two years in a program designed to marry a weapon system built by Hughes Aircraft Co. to the Mirage III. Daily flight tests and numerous gunnery tests, along with many missile firings, qualified the Mirage III as a first-line aircraft for the Swiss Air Force. It is not too unusual to find British accents scattered across the base as both the Royal Canadian Air Force and the Royal Air Force have had projects at Holloman.

During the same period, the inter-Service aspect of the center's workload was demonstrated at the guidance test facility when an inertial navigator was readied for flight tests in a C-130 for the U.S. Navy. The tests consisted of three major phases: static pre-flight ground testing of the systems; aerial tests in a C-130 flying laboratory; and operational tests in either a F-106 (for fighter navigators) or a C-130 (for transport navigators). This facility is the focal point in DOD for test and evaluation of aircraft inertial navigation systems. The Navy will return this year for still other tests of yet another navigation item.

AS THE preceding brief summation of one day's activities illustrates the variety of mission activity at Holloman, a further look into its mission activities will reflect the dynamic, fast-moving chain of events at the center, and their contribution to the U.S. military technological superiority.

First, there is an extensive program in the launching of probes. Sounding rockets at Holloman lift atmospheric probes and parachute tests. Many of these tests are conducted at the center because of the extensive instrumentation and excellent payload recovery capabilities at the adjacent WSMR.

Also tests are sponsored by the Air Force Logistics Command for the improvement of the Air Defense Command's F-106 weapon system. These tests require careful control and concurrent plotting of the flight path of an aircraft, a drone target and a missile. Again, this is possible at the center because of the instrumentation facilities of WSMR.

Holloman was also the scene of RF-4C tests and the base/range complex is capable of testing any reconnaissance system in the future. Facilities are available for testing any type of sensor. To support this type of testing, the Air Force has installed a complex of ground targets, including an infra-red mapping range 200 miles long—extending from El Paso, Tex., to Santa Fe, N.M. It is the most complete aerial reconnaissance range in the United States because of available airspace, reconnaissance sensor targets, and range facilities that include accurate range instrumentation, telemetry facilities and data reduction.

IN ANOTHER area the center tests and evaluates improvements to the drone target. The center is able to do this because of its complete data reduction and optical instrumentation facilities and their physical layout on WSMR.

In conducting these and other tests the Air Force uses over 35 percent of the total range time scheduled by WSMR and schedules nearly half of the total tests allocated for the range.

In support of many other projects, the 35,588-foot test track conducts over 350 tests a year—FY 1967 established a record with 478 tests. This includes testing of escape mechanisms, guidance systems, structures, and the effects of fuze impact, rain erosion, and blast and vulnerability.

Among the most dramatic test currently being conducted at the track are the rain erosion experiments. Rain erosion tests simulate rains of up to 12 inches per hour and provide controlled water droplet size. Rain erosion tests have been conducted for the Sandia Corp., the Army, Navy and Great Britain to determine effects on radomes and missile nose cones. A further series saw blast testing conducted for the Navy's Polaris missile test program.

Further elongation of the test track is now in the planning stage to meet future needs. This will enable high-speed, heavy-load test sleds to obtain the speed necessary and also have suf-

A giant balloon stands ready to be launched from the Air Force Missile Development Center by a launch crew from Detachment One, Balloon Research and Development Test Branch of the Air Force Cambridge Research Laboratories. Numerous balloons are launched each year by the detachment in support of many government research programs. A 26-million cubic foot balloon, the largest ever launched, was sent aloft from Holloman AFB on July 18, 1966.

ficient track distance remaining for deceleration to insure the safe recovery of the sled load. A state-of-the art advancement within this area was achieved in May of this year when a slim, aerodynamically shaped monorail vehicle established a new land speed record for a recoverable vehicle. The sled traveled more than six times the speed of sound reaching a velocity of 6,750 feet per second, or 4,600 miles per hour, during the 30,000-foot run down the track.

IN OTHER areas the center supports radar terrain avoidance tests to collect data on the operation and predictability of a system when exposed to variations in altitude, terrain and antenna incidence angle; turbulence studies in a program known as LO-LOCAT; the Athena missile firing program in support of the advanced ballistic missile re-entry systems program; tests on the inertial navigation system for the C-5A; various projects supporting the nation's Southeast Asia efforts; and component tests of an air-to-ground short range attack missile (SRAM). SRAM will be equipped with a guidance system which is expected to help it find its target with deadly accuracy, after pre-directed signals from a master navigator in the launch aircraft to start it on its way. The center will test the missile in its guidance laboratory, on the 35,588-foot track, in its Directorate of Aircraft and Missile Test, and at its Radar Target Scatter Site which will be discussed later.

Past support has been given to the Surveyor lunar soft-landing vehicle; to the Hound Dog missile; and to the ejection system for the OV–10A, the first hardware resulting from the LARA (Light Armed Reconnaissance Aircraft) or the FAC (Forward Air Control aircraft) concepts which the Air Force intends to use primarily in the FAC mission role. Other important future programs will be the testing of five inertial navigation systems for the Advanced Manned Strategic Aircraft (AMSA); the SRAM tests mentioned earlier; and tests of the Maverick.

One of many nose cones measured at the Air Force Missile Development Center's Radar Target Scatter Site is mounted on a styrofoam target support. Vehicles up to 55 feet long and as heavy as 6,000 pounds have been measured at the site. The scatter site complex is used to measure the static radar cross sections of actual or scale models of aerospacecraft such as nose cones, decoys and satellites.

A unique activity at the center is the Radar Target Scatter Site. It measures the radar reflectivity of both full-size and smaller-scale models of stationary bodies. It collects characteristic radar signatures reflected from weapon systems, nose cones, decoys and aerospacecraft. Moreover, the center operates an $18 million radar complex and participates in the collection of data on dynamic bodies. The data is processed through the center's completely equipped computation facility.

LENDING to the diversification in mission activities at Holloman are the mission activities of its many attached organizations. These units range in size from a two-man Navy liaison office to a presently deployed tactical flight wing of over 2,000 people. They differ in activities from the hard core of scientists of the Office of Aerospace Research to Army specialists in support of range activities.

First, there are two electro-optical surveillance facilities located near Cloudcroft, N.M. One, under development by the AFSC Electronic Systems Division, integrates into the USAF Space Track System under the operational control of the Air Defense Command. The second, operated by the AFSC Avionics Laboratory, develops equipment for tracking satellites.

There is also the Air Force balloon research and development test group of the Air Force Cambridge Research Laboratories, Bedford, Mass. The large balloon is an excellent vehicle for scientific research in that area of the earth's atmosphere between aircraft and satellite altitudes. The center's aircraft support this unit by monitoring the launch and cross-country flight path of the balloon. The aircraft also carry a truck and crew to recover the instrumentation packages.

Still another prominent unit is the 6571st Aeromedical Research Laboratory which trains animals for behavorial research, including the evaluation of the effects of various environmental conditions on biological specimens. This organization uses both the center's test track and environmental laboratory facilities. The environmental laboratory conducted tests, in coordination with NASA and the AFSC Aerospace Medical Laboratory and its chimpanzees, to determine if a pilot of a spacecraft would have sufficient time to bring back into the craft a fellow astronaut, who had torn his suit or broken his face plate during a space walk, to close the hatch, and to repressurize without a fatality.

The latest unit to join Holloman is the 4758th Defense Systems Evaluation Squadron of the Air Defense Command, whose mission is aimed at the degrading of Army ground radar systems from the air. Ground radar weaknesses are pinpointed and, as a result, improvements are made. The squadron also flies tow target missions for weapons practice and aircraft sorties to train radar crews in aircraft acquisition and tracking.

WITH this diversification, AFMDC and Holloman AFB have continued to grow together. Its strength is visible not only today but also is reflected in its future—a future which will contribute to our technological superiority and, in turn, to our military superiority.

In the future, the WSMR/Holloman complex, because of its unique geographical assets, could become one of the major sites for space activity. Fifteen miles west of Holloman lie the Alkali Flats, a 100-square-mile area, extremely flat, free of vegetation where the elevation varies less than 25 feet. This area is a potential land recovery site for orbital vehicles. It can accommodate an aerospace launch and recovery facility to test potential future space vehicles, designed for horizontal launch and landing, or a booster recovery evaluation facility to test scale model prototype or recoverable boosters in the Titan III and larger classes.

Presently a 38,000-foot landing strip is in use in the Alkali Flats. The area is large enough to accommodate several runways varying in length from 40,000 to 90,000 feet. The strip and the entire Alkali Flats are capable of supporting the weight of a B-52 aircraft.

Whether these ideas become actualities depend on many factors. Among them are technological breakthroughs, military requirements, economic factors, political factors, and international tensions.

As General McConnell has said, ". . . military superiority can no longer be achieved and maintained without overall technological superiority. As a result, we are engaged in a technological war which poses many problems as well as challenges. One of our most difficult tasks in that war is to assess accurately the technological capabilities of our opponents and to prevent technological surprise. Nor is it enough to try to keep up with the rapid progress of our opponents; we must retain the initiative and endeavor to stay far ahead of them. That is why we must have a vigorous research and development program."[1]

The variety of mission activities supported by both AFMDC and Holloman's attached units are testimony in themselves to our overall contribution to the research and development effort in maintaining U.S. technological superiority. To this end the personnel of Holloman and our total mission effect are dedicated.

---

[1] *Speech by General J. P. McConnell, Chief of Staff, U.S. Air Force, to the National Security Industrial Association, Los Angeles, Calif., Jan. 13, 1966.*

Colonel George T. Buck, USAF, is Commander of the Air Force Missile Development Center, Holloman AFB, N. M. Prior to assuming this command, he served as Director of the Air Force Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio. He is a graduate of the U.S. Military Academy and holds a Master of Science degree in aeronautical engineering from the University of Michigan.

Navy Releases Navigation Satellite for Commercial Use

Vice President Hubert Humphrey, Chairman of the National Council on Marine Resources and Engineering Development, has announced Presidential approval of a recommendation to release the Navy Navigation Satellite System for use by civilian ships, and for commercial manufacture of the shipboard receivers on an unclassified basis.

The recommendation was developed by the Navy in support of initiatives of the Marine Sciences Council to strengthen world-wide navigational aids for civilian use.

For the past year increasing interest has been shown in the system by the industrial oceanographic community, off-shore oil exploration companies, and other segments of U.S. industry interested in the commercial application of the system for ships requiring accurate investigation.

The Navy, therefore, will provide the National Security Industrial Association with the necessary technical information and documentation concerning shipboard equipment, for use on an equal basis by any interested U.S. party.

The all-weather satellite navigation system, referred to as the Transit System, has been in use since 1964 by the Navy.

The system consists of three elements: four ground tracking stations (located in Hawaii, California, Minnesota and Maine), the satellites in polar orbits at altitudes of 600 nautical miles, and the user equipment consisting of a sophisticated radio receiver and an associated computer.

The system was developed by the Applied Physics Laboratory at Johns Hopkins University.

Army Agency Renamed

The Army Corps of Engineers Geodesy, Intelligence, Mapping, Research and Development Agency has been renamed the U.S. Army Engineer Topographic Laboratory.

ABOUT PEOPLE

DEPARTMENT OF DEFENSE

Harry H. Schwartz has been assigned as Dep. Asst. Secretary of Defense (Near East and South Asian Affairs), Office of the Asst. Secretary of Defense (International Security Affairs).

Brig. Gen. Richard M. Scott, USAF, has been appointed Dep. Asst. to the Secretary of Defense (Atomic Energy).

Brig. Gen. Donald H. Cowles, USA, has been assigned as Military Asst. to the Asst. Secretary of Defense (Public Affairs).

Brig. Gen. W. E. Gernert, USAF, has been assigned as Dep. Commander (Weapons and Training), Field Command, Defense Atomic Support Agency, Sandia Base, N.M.

Col. Willis L. Helmantoler, USAF, has been assigned as Military Asst. to Dep. Asst. Secretary of Defense (Public Affairs) Daniel Z. Henkin.

Julian R. Levine, has been appointed Special Asst. to the Asst. Secretary of Defense (Public Affairs).

David C. Stewart has been designated Special Asst. to the Asst. Secretary of Defense (Manpower).

Col. Peter P. Adams, USAF, has been assigned to the Defense Communications Agency as Chief of the Data Processing Division.

Col. Benjamin C. Marshall, USAF, has been appointed Chief, Office of Industrial Security, Defense Contract Administration Services, Defense Supply Agency.

Col. Merle M. Zeine, USAF, has been named Dir. of the Defense Department's AIMS Systems Program Office, at Wright-Patterson AFB, Ohio.

DEPARTMENT OF THE ARMY

Maj. Gen. Frank G. White has assumed command of the Army Munitions Command, Dover, N.J., succeeding **Maj. Gen. Floyd A. Hansen,** who has retired. Gen. White was promoted to two-star rank upon assuming command.

Brig. Gen. James F. Hollingsworth is the new Dep. Commanding General, Army Test and Evaluation Command, Aberdeen Proving Ground, Md.

Col. Charles E. Kunkel has been assigned as Project Manager, General Purpose Vehicles, Michigan Army Missile Plant, Warren, Mich.

Col. Nelson A. Mahone Jr. has been named Project Manager for the Cayuse Project, at the Aviation Materiel Command, St. Louis, Mo.

Col. Arthur F. Pottle Jr. has been named Project Manager for the Lance Missile at the Army Missile Command, Huntsville, Ala.

DEPARTMENT OF THE NAVY

Charles F. Baird has assumed duties as Under Secretary of the Navy. Mr. Baird, former Asst. Secretary of the Navy (Financial Management), replaces **Robert H. B. Baldwin,** who has resigned from the post.

Randolph S. Driver has been appointed Dep. Under Secretary of the Navy (Manpower), succeeding **Richard A. Beaumont.**

RAdm. Jackson D. Arnold has been named Vice Chief of Naval Material.

RAdm. Francis D. Foley has been named Commandant of the Third Naval Dist., with headquarters in New York, N.Y.

RAdm. Paul E. Seufer has been named Dep. Commander (Planning), Naval Facilities Engineering Command.

RAdm. Nathan Sonenshein, has assumed duties as Dep. Chief of Naval Material (Logistic Support).

RAdm. Albert H. Clancy Jr. became Project Manager for the F–111B/Phoenix Program on Sept. 16. He succeeds **RAdm. William E. Sweeney** who has retired.

Capt. Robert E. Adamson Jr. has been named Dep. Commander for Fleet Maintenance and Logistic Support at Navy Ship Systems Command headquarters, Washington, D.C.

Capt. Melvin R. Etheridge has been named Commanding Officer, Naval Weapons Center, China Lake, Calif.

Capt. Edward D. Franz has succeeded **Capt. Grover L. Rawlings** as Commanding Officer, Navy Maintenance Support Office, Navy Ships Parts Control Center, Mechanicsburg, Pa.

Capt. Robert I. Marr has been assigned duty as Project Manager, Naval Inshore Warfare Project, Naval Material Command.

Capt. Robert H. St. Clair has reported to Pacific Missile Range, Point Mugu, Calif., for duty as Dep. Vice Commander. He replaced **Capt. Thomas L. Andrews** who has moved to the position of Vice Commander.

Capt. John D. Working has relieved **Cdr. R. M. George** as Officer-in-Charge, Naval Ship Engineering Center, Philadelphia, Pa.

Capt. Mark W. Woods has been named Vice Commander, Naval Ordnance Systems Command, Washington, D.C.

DEPARTMENT OF THE AIR FORCE

Maj. Gen. Thomas K. McGehee, has been ordered to Air Force headquarters for duty as Asst. Dep. Chief of Staff (Programs and Resources).

Maj. Gen. William W. Veal has been named Commander, Sacramento Air Materiel Area, Air Force Logistics Command, McClellan AFB, Calif.

The following assignments have been made within the Air Force Systems Command:

Col. Sherman P. Cummings, Systems Program Dir., Long Lines Communications, Electronic Systems Div., L. G. Hanscom Field, Mass.; **Col. Dale D. Davis,** Dir., Air Force Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio; **Col. Robert L. Edge,** Dir., Space Defense Systems Program, Electronic Systems Div., L. G. Hanscom Field, Mass.; **Col. Albert P. Lovelady,** System Program Dir., Life Support SPO, Aeronautical Systems Div., Wright-Patterson AFB, Ohio; **Col. Otis A. Prater,** Chief, Systems Engineering Div., Special Weapons Center, Kirtland AFB, N. M.; **Col. John B. Shipp Jr.,** Commander Air Force Materials Laboratory, Wright-Patterson AFB, Ohio; **Col. Kenneth L. Skeen,** Chief, Munitions Test Div., Air Proving Ground Center, Eglin AFB, Fla.

The New Face of Contract Administration

Captain I. G. Cockroft, USN

Field contract administration in the Military Services has undergone rather dramatic changes, both in organization and in concept, in the past three years. This article discusses these changes, their evolution, and the need for recognition of the new, centralized contract administration organization.

Contract administration, also referred to as contract administration services, consists of those actions that must be taken by the Government, vis-a-vis the contractor, from the time the contract is awarded until the material or services have been delivered and accepted, paid for, and the contract closed out. The functions range all the way from production surveillance, inspection, quality assurance and cost/price analyses on the one hand, to allowance of costs, change in order pricing, termination settlements, property management and contract close-out on the other. Once a contract is awarded, the contract administrator is the prime link between the contractor and the procuring or requiring activity.

The breadth of contract administration functions, and the time spans involved, are so considerable as to represent a major portion of the procurement cycle. Furthermore, the success of any procurement is often directly dependent on how well the contract administrator performs his job. Hence the importance of effective contract administration cannot be overemphasized.

Today's contract administration posture within the Defense Department was precipitated by a study, called "Project 60," initiated by the Secretary of Defense in 1962. Detailed analysis of the management of defense contracts indicated that the contract administration functions could be performed both more efficiently and more economically.

As a result of this study, the DOD Contract Administration Services Directorate was established under the Deputy Assistant Secretary of Defense (Procurement) in the Office of the Assistant Secretary of Defense (Installations and Logistics). In carrying out its responsibility for overall development and coordination of contract administration policy, the directorate has concentrated on developing a strong plant cognizance program, establishing DCAS (Defense Contract Administration Services), creating a contract administration review capability within the Office of the Secretary of Defense, and developing contract administration coverage in the Armed Services Procurement Regulation (ASPR). These efforts are oriented to the total performance of contract administration services by all DOD activities.

It is the policy of DOD that contract administration, in a given contractor's plant, will be performed by a single DOD component for all DOD contracts. This policy is effected by means of the plant cognizance program.

Colonel Gerald Johnson Jr., USA, Director, Defense Contract Administration Service Region, Philadelphia, Pa., and one of his quality assurance representatives at the FMC plant in Charleston, W. Va., check the road arm torque on the suspension system of the M113 armored personnel carrier.

The plant cognizance concept is not new. It actually had its beginning in 1938, when the Navy Bureau of Aeronautics made an agreement with the Army Air Corps to perform inspection at the Hamilton Standard plant in Connecticut. Plant cognizance at this early stage, however, was not so much a program as it was a series of individual agreements which provided for the work to be done, and which were effective only as long as desired by the parties to the agreements. Furthermore, these agreements involved only part of the many functions that are now routinely assigned to field contract administrators.

Over the years, inspection cognizance was assigned to a single Military Department at a large number of contractors' plants. Still, it was not uncommon for each of the Departments to have field offices in the same general area, all doing business with the same contractors. In fact, there were numerous examples where more than one Department had a field contract administration office in the same plant.

The plant cognizance program has corrected this situation. All field contract administration functions for any defense contract being performed in a given plant must be assigned to the component having cognizance of that plant. Thus, in the field administration of contracts, DOD through the plant cognizance has materially enhanced the "one face to industry" approach.

Field contract administration in the Defense Department is performed by two basic organizational elements:

Military Department Plant Representative Offices. These offices are contract administration representatives of the Military Departments, assigned to individual contractor plants for the purpose of administering contracts for technical materials. For the most part, the plants assigned to the Military Departments are those producing major equipment and weapon systems or sub-systems that are of critical military importance, highly technical, and with limited application. Approximately 60 percent of the value of all defense contracts are administered by plant representative offices.

DCAS (Defense Contract Administration Services). Prior to 1963 each Military Department had its own contract administration organization to administer contracts for less complex, general purpose and subcontracted materials which were not assigned to a plant representative for administration. These organizations were set up on a regional basis, and there was a minimum of coordination of inspection or other functions among the different Departments.

It is in the organization for performing common contract administration services for other than the most complex weapon systems that major changes have been wrought, through the establishement of DCAS.

The DCAS organization also grew out of the Project 60 study. In October 1963, a pilot test of uniform contract administration procedures and policies was initiated in the Philadelphia area, using the combined resources of Army, Navy and Air Force contract administration field offices. Consolidation of contract administration offices followed rapidly in other geographic areas, and was completed in December 1965.

DCAS was organized as a component of the Defense Supply Agency, and is headquartered at Cameron Station, Alexandria, Va. Eleven regional offices have been established in Atlanta, Boston, Chicago, Philadelphia, New York, Detroit, Cleveland, St. Louis, Dallas, Los Angeles and San Francisco. Each region is subdivided into districts and includes plant and/or area offices, as necessary, in relation to the volume and importance of defense contracts.

Some 20,000 personnel (500 military and 19,500 civilian), who previously performed contract administration in the individual Services, were transferred to the DCAS offices as they were activated throughout the nation.

Thomas R. Markey, Chief Inspector of KVS Ammunition Plant, Danville, Pa., inspects 60mm mortar shells. As a company inspector his inspection system is monitored by a resident Defense Contract Administration Service quality assurance representative.

Approximately 75 percent of all Military Department and DSA contracts, requiring field contract administration, are now assigned to DCAS. However, these contracts represent less than half of the dollar awards. In round numbers, DCAS performs all contract administration functions for about 200,000 prime contracts. (An additional 120,000 contracts are assigned for partial administration; most of these involve only material inspection.) Although many of these contracts are for general purpose, non-technical items, DCAS also administers contracts for complex equipment and components that require a high degree of technical expertise.

As one might expect, DCAS encountered many problems in assuming the DOD contract administration function.

Procedures. First was the fact that most of the DCAS personnel were familiar only with the contract administration procedures of their former Service. Each Service's procedures differed markedly. In fact, this was one of the main reasons for creating a unified contract administration agency.

Thus ex-Navy inspectors had to become familiar with the Air Force way of doing business, and ex-Army personnel had to study Navy methods. Of course, the obvious solution was development of uniform contract administration procedures that could be applied to all contracts. Such procedures were developed and issued in the form of DCAS manuals covering the various functions of contract administration, such as production and quality assurance. Ultimately many of these procedures are to be incorporated into the Armed Services Procurement Regulation.

Paperwork. The vast amount of paperwork that currently flows to and from the DCAS offices has presented a severe problem, not only to DCAS but also to other activities involved in the award and administration of contracts. Improved procedures and elimination of non-essential reports and forms will help. However, the best hope of ultimate resolution, or at least abatement, of this problem appears to lie in the introduction of MILSCAP (Military Standard Contract Administration Procedures).

MILSCAP will provide for an automated (and uniform) flow of data between contract administration offices and other interested activities, *e.g.*, procuring offices, consignee activities, paying offices, and other contract administration offices. Unfortunately, the complexity of this program is such that MILSCAP will not be fully implemented for some time.

Payments. Excessive delay in the payment of contractors' invoices was an unexpected and particularly vexatious problem during the early months of DCAS operation. However, DCAS has now reduced its invoice processing time to a nation-wide average of 11 days.

A major obstacle to further improvement is the difficulty of obtaining timely material acceptance documents. This particular problem will be alleviated by the introduction of MILSCAP which will call for rapid automated transmission and processing of acceptance documents whenever possible. Automated reporting of material receipt and acceptance, utilizing the Automatic Digital Network (AUTODIN), was instituted on a test basis between the Navy Supply Centers at Charleston and Oakland and the DCAS regional offices, and on Sept. 1, 1967, was expanded to all Naval activities with AUTODIN capabilities.

PCO/ACO Interface. Perhaps the most serious problem, and one that was inherent in the creation of a unified organization such as DCAS, was the establishment of smooth working relationships between the procurement contracting officers (PCOs) and the administrative contracting officers ACOs.

Prior to DCAS, PCOs dealt for the most part with ACOs of their own Service. Thus PCOs and ACOs spoke the same language. They generally understood and appreciated each other's problems and objectives. Informal working relationships and procedures were developed to meet peculiar conditions. Under DCAS, a PCO often dealt with an ACO, who had previously worked for one of the other Services and who, therefore, was perhaps not familiar with the PCOs requirements, problems and methods of doing business. Sometimes this unfamiliarity extended to technical matters, when ACOs were called on to administer contracts for items or equipment with which they had no previous experience.

The PCO could exercise direct control over his contracts but only at the expense of additional workload and further aggravation of the breach between PCO and ACO.

As DCAS "comes of age," more acceptance is apparent. Navy PCOs are recognizing the capability they have at their disposal in the DCAS organization and are assigning more and more functions to the ACOs. In some instances, procuring or requiring activities have finessed the "technical inexperience" problem by assigning technical specialists to DCAS offices for liason purposes, and to provide technical guidance and assistance to DCAS personnel.

From a workload standpoint, most PCOs can no longer afford to retain any function that can properly be assigned elsewhere. PCOs have assigned to DCAS offices such functions as:

- Pricing of change orders issued by PCOs.
- Placing orders for and pricing provisioned parts.
- Adjusting delivery schedules that prove unrealistic.

The foregoing are but a few of the many problems that DCAS has faced. Most of these problems are not susceptible to quick resolution by DCAS alone. They require a concerted effort, over a long period of time, by all parties involved in the procurement

(*Continued on page 27*)

Captain I. G. Cockroft, USN, is the Quality Assurance Director at the Defense Contract Administration Services Region, San Francisco, Calif. He previously served as Director, Contract Administration Division, under the Deputy Chief of Naval Material (Procurement and Production), Naval Material Command, Washington, D.C.

QDRI

The Technical Information Exchange

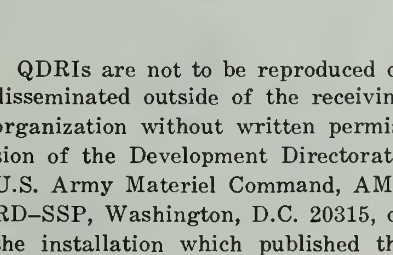
The Qualitative Development Requirements Information (QDRI) Program of the U.S. Army Materiel Command (AMC) is an information exchange program which enables industry and the Army to take advantage of the Department of the Army policy on scientific and technical information. It is the Army's policy to pursue vigorous, well organized, thoroughly coordinated, comprehensive information programs to provide for the interchange of technical information between the Department of the Army and the scientific and technical community to the maximum extent permitted by security.

Army installations create the QDRI documents, distribute the documents, qualify organizations, issue invitations to briefings, perform liaison between civilian and Army technical personnel and evaluate reports and unsolicited proposals.

QDRI documents, prepared by the Army to reveal the Army's research and development needs, are released to participators registered in the QDRI Program to enable these organizations to determine if they can help the Army fulfill its goals. On occasion, QDRI information is released in forms other than printed documents, as in the case of classified briefings.

Organizations which are registered in the QDRI Program ("qualified organizations") receive QDRIs and are also eligible to receive collateral documents which offer much valuable background data. These supporting documents are made available by the Defense Documentation Center, Cameron Station, Alexandria, Va., 22314. They enable the qualified organizations to create meaningful reports or unsolicited research and development proposals which are aimed at solving stated needs of the Army. While QDRIs are not often revised, on rare occasions they may be updated to reflect changes of objectives or reflect changes in the state of the art. QRDIs are assigned cut-off dates which are estimated to be far enough in the future to allow the recipients to evaluate and report on the QDRI, and to create an unsolicited proposal if they decide to do so.

Qualified organizations are not required to return old documents before receiving new ones. They simply destroy old QDRIs in accordance with paragraph 14 of the Industrial Security Manual for Safeguarding Classified Information.



QDRIs are not to be reproduced or disseminated outside of the receiving organization without written permission of the Development Directorate, U.S. Army Materiel Command, AMC RD–SSP, Washington, D.C. 20315, or the installation which published the QDRI.

Eligibility To Participate in the QDRI Program.

The QDRI Program is open to individual scientists, industrial, educational, or non-profit technical organizations with adequate research and development capabilities as evidenced by facilities, personnel and accomplishments, and who can meet Army regulatory requirements for integrity and reliability. Although it is not generally advisable, certain individuals and organizations with special abilities may be qualified for unclassified QDRI only. Canadian organizations which have been cleared and approved by Canadian Department of Defence Production may also apply for registration in the program.

Security Requirements.

Classified QDRIs can only be supplied to participants in strict accordance with established facility and individual security regulations. Some QDRIs are regularly released to qualified organizations at classified briefings. Therefore, usually only organizations which possess, or are able to obtain, security clearances are eligible to become registered in the QDRI Program.

Determination of Qualifications of an Organization.

All Army procurement offices, including special detachments which perform contract execution only, are involved in the QDRI registration process in connection with the establishment of research, development, technology and engineering (RDTE) bidders lists. DOD contracting and procurement activities include Defense Contract Administration Service (DCAS) districts and regions which are capable of informing applicants about registration procedures, and able to supply necessary forms and instructions.

The credentials which the applicant should supply are area of interest and capabilities, scientific and technical personnel, facilities, related contracts, related "in-house" research and development effort, financial statement, and an executed policy agreement.

A procurement office will be selected as the registration office. West of the Mississippi Valley, it will be either the Northwest or Southwest Procurement Agency based on geographical considerations. East of the Rockies it will be a procurement detachment or a major procurement office in one of the Army's commodity centers based on a maximum match of commodity interests. Selection of the primary office of registration may be made either by a central Army referral office or by the applicant organization. A mutually agreeable arrangement will be made between the first Army office contacted and the applicant organization.

Registration offices will place firms with RDTE interests on appropriate bidders lists, and will insure that appropriate registration data is forwarded to all Army agencies with interests matching those of the registering organizations. QDRI managers in the Army's commodity centers and laboratories will qualify registered organizations according to their assigned missions. Where the selected procurement office is in a commodity center or commodity-oriented laboratory, the QDRI office in the installation will become the primary qualification office. The procurement agencies and detachments will also provide Army-wide qualification services for the organizations registered with them.

The prime qualifying office will be able to assist the applicant in selecting other agencies, such as arsenals and laboratories in other commodity centers, which should receive secondary registrations. The applicant will forward appropriate (generally identical) registrations, brochures and forms to the other agencies. Arsenals, laboratories and other RDTE agencies will conduct a technical review of each applicants qualifications, and will certify registration in appropriate scientific and technical categories. The applicant is then completely qualified to receive appropriate QRDI.

Approval or Disapproval of an Organization for Participation in the QDRI Program.

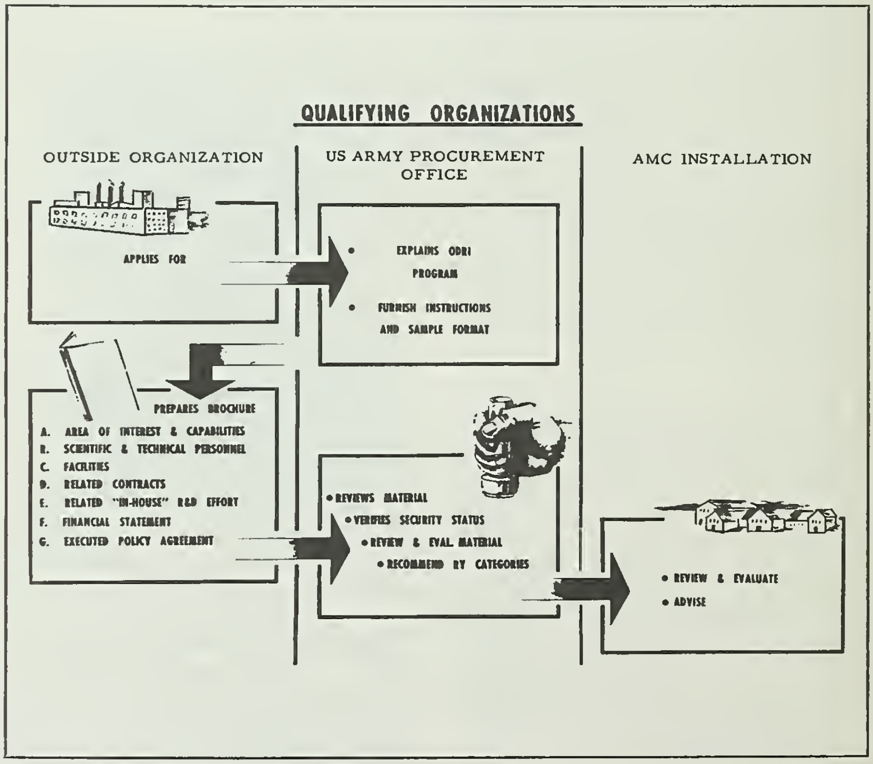
Initial approval or disapproval is given by the primary qualifying office which will hold the original policy agreement, a document expressing the terms under which the Army will accept the registration of civilian organizations in the QDRI Program. Confirmatory approval will be provided by each QDRI manager who accepts the registration data. As stated previously, each organization is still subject to approval for receipt of specific, especially classified, QRDIs. Evaluation boards or committees may be employed at the installation level.

Initiation of Participation in QDRI.

The prospective QRDI applicant must look to the major Army commodity centers (listed at the end of this article) for initial qualification actions. With the exception of the previously mentioned procurement agencies and detachments, all Army procurement districts have been completely converted to offices in the Defense Contract Administration Services organization and to procurement activities in commodity centers. Procedures are still being developed for DCAS participation in QDRI; however, plans are that DCAS will furnish mainly an information distribution center, referral, security clearance, and survey service. The documents to be prepared by industry include brochures containing organization credentials, a policy agreement, a security agreement, and the Research and Development Capability Index which defines fields of research and development interest for both RDTE bidders lists and the QDRI Program.

What is the Research and Development Capability Index?

As part of the qualification procedure, the prospective qualified organization completes a Research and Development Capability Index and other associated forms. The basic index requests information about the internal structure of the applicant organization. The associated forms are a listing of most of the scientific and technical disciplines (fields of interest). The applicant is obligated to carefully consider which of the many fields of interest apply to his organization. There is also an area for the applicant to indicate research and development categories for each field of interest. These categories are the Office of the Secretary of Defense program categories now used in DOD program plans: research, exploratory development, advanced development, engineering development, operational system development, or management and support.


QUALIFYING ORGANIZATIONS
OUTSIDE ORGANIZATION
US ARMY PROCUREMENT OFFICE
AMC INSTALLATION
APPLIES FOR
• EXPLAINS QDRI PROGRAM
• FURNISH INSTRUCTIONS AND SAMPLE FORMAT
PREPARES BROCHURE
A. AREA OF INTEREST & CAPABILITIES
B. SCIENTIFIC & TECHNICAL PERSONNEL
C. FACILITIES
D. RELATED CONTRACTS
E. RELATED "IN-HOUSE" R&D EFFORT
F. FINANCIAL STATEMENT
G. EXECUTED POLICY AGREEMENT
• REVIEWS MATERIAL
• VERIFIES SECURITY STATUS
• REVIEW & EVAL MATERIAL
• RECOMMEND BY CATEGORIES
• REVIEW & EVALUATE
• ADVISE

The Research and Development Capability Index will be used in conjunction with a new Standard Form 129 and will be issued as a uniform requirement of the Armed Services Procurement Regulation. This index will be used for both the QDRI Program qualification lists and normal procurement-oriented research and development bidders lists. Some Army installations have this type of information semi-automated and others have it fully automated for fast and accurate production of mailings of announcements to appropriate bidders.

AMC is establishing a uniform automation program for the recording of QDRI data. This program will include the designation of a specific AMC installation as the central AMC data bank for QDRI.

Responsibilities of Qualified Organizations Receiving QDRI.

In the interest of national security, all organizations participating in the QDRI Program have a responsibility to report back, within 90 days, to the agency which issued the QDRI. This report should indicate whether the organization can contribute anything toward the solution of the QDRI. If an organization feels that it can contribute to the QDRI Program, it might develop an unsolicited proposal which is submitted to the QDRI manager at the address indicated on the QDRI.

How and Where To Submit Reports on QDRI Evaluations.

The first report is expected to be a letter, within 90 days of the QDRI publication, saying "We expect to submit an idea or solution." Negative reports are not required except in the case of classified requirements. If the idea or solution can be presented in 90 days, the letter is of course not required. Ideas or solutions may be presented at any time before the cutoff date on the QDRI to the installation originating the QDRI, unless other instructions are issued.

The report may be in any of the normal technical-report formats commonly used in industry. In the event that the organization has already explored the subject and possesses a report on the subject of the QDRI or a closely related subject, this report may be submitted in lieu of a newly created report.

If the report is sufficiently comprehensive (or can be modified accordingly) to be equivalent to an unsolicited proposal, the report may actually be submitted as an unsolicited proposal. All unsolicited proposals should be so labeled.

The following list contains the Army procurement offices and other Army RDTE offices which serve as the initial contact point for civilian organizations wishing to participate in the QDRI Program. When visiting these offices, ask to speak to the QDRI manager. In any case where a QDRI manager does not exist, it is appropriate to make contact with the Small Business Office.

U.S. ARMY COMMODITY CENTERS

Southwest Procurement Agency
55 S. Grand Ave.
Pasadena, Calif. 91105

Northwest Procurement Agency
1515 Clay St.
Oakland, Calif. 94604

U.S. Army Chicago Procurement Detachment
623 S. Wabash Ave.
Chicago, Ill. 60605

U.S. Army Cincinnati Procurement Detachment
Federal Office Building
550 Main St.
Cincinnati, Ohio 45202

U.S. Army New York Procurement Detachment
207 W. 24th St.
New York, N.Y. 10011

Headquarters, Army Electronics Command
Fort Monmouth, N.J. 07703

Headquarters, Army Missile Command
Redstone Arsenal, Ala. 35809

Army Tank-Automotive Command
Warren, Mich. 48090

Army Mobility Equipment Command
St. Louis, Mo. 63166

Army Engineer R&D Laboratories
Fort Belvoir, Va. 22060

Army Aviation Materiel Command
St. Louis, Mo. 63166

Army Aviation Materiel Laboratories
Fort Eustis, Va. 23604

Army Munitions Command
Dover, N.J. 07801

Edgewood Arsenal
Edgewood Arsenal, Md. 21010

Frankford Arsenal
Philadelphia, Pa. 19137

Picatinny Arsenal
Dover, N.J. 07801

Army Weapons Command
Rock Island, Ill. 61202

Rock Island Arsenal
Rock Island, Ill. 61202

Watervliet Arsenal
Watervliet, N.Y. 12189

Army Test and Evaluation Command
Aberdeen Proving Ground, Md. 21005

Army Ballistic Research Laboratories
Aberdeen Proving Ground, Md. 21005

Natick Laboratories
Natick, Mass. 01762

Army Materials Research Laboratory
Watertown Arsenal
Watertown, Mass. 02172

Harry Diamond Laboratories
Washington, D.C. 20438

DEFENSE PRIME CONTRACT AWARDS TO SMALL BUSINESS

(Amounts in Thousands)

	July 1966–June 1967	July 1965–June 1966
Procurement from All Firms	$40,608,892	$34,877,967
Procurement from Small Business Firms	8,360,725	7,611,496
Percent Small Business	20.6	21.8

New Policy Set for Announcing Defense Documents

The Technical Abstract Bulletin (TAB), issued by the Defense Documentation Center (DDC), no longer carries duplicate announcements of DOD scientific and technical reports appearing in U.S. Government Research and Development Reports (USGRDR).

DOD reports approved for public release and sale will now be announced only in USGRDR, which is available from the Clearinghouse for Federal Scientific and Technical Information, U.S. Department of Commerce, Springfield, Va. 22151, on a subscription basis.

DDC will provide its users with a copy of each issue of USGRDR and its index, "Government-Wide Index to Federal Research and Development Reports." TAB, which will now contain only announcements of those reports which are classified or controlled, will be supplied to those organizations accredited for classified service.

The change refers only to the announcement of reports and not to the availability of the reports themselves. DDC will continue to supply copies, for official purposes, of any DOD-sponsored report even though it is announced through USGRDR. Non-DOD reports listed in USGRDR will be available for purchase by DDC users directly from the Clearinghouse.

Both TAB and USGRDR are published twice a month.

AOA Chemical Biological Nuclear Annual Meeting Set

The annual meeting of the Chemical, Biological Nuclear Division of the American Ordnance Association will be held at Andrews AFB, Washington, D. C., Nov. 2–3, 1967. "CBR Research and Development Programs Needing Industry Support" is the theme of the meeting.

A banquet will be held on the evening of Nov. 2 at the Andrews AFB Officer's Open Mess.

For additional information contact: Norman I. Shapira, Litton Industries, Inc., 1875 Connecticut Ave NW, Washington, D. C. 20009, Phone: (202) 462–8833.

New Army Agency Supports DCS Project

The U.S. Army has established a joint project management agency at Fort Monmouth, N.J., to facilitate a more rapid and effective response in the expansion and modernization of the Defense Communications System (DCS).

The newly created U.S. Army Communications Systems Agency (USACSA) will be under the command of Colonel Blaine O. Vogt, who will double as Army Materiel Command project manager in coordinating Army efforts for the DCS.

USACSA, a subordinate command of the U.S. Army Strategic Communications Command, will be responsible for the development and acquisition of strategic communications systems to meet requirements of a global network.

USACSA will be involved in research, engineering, development, procurement, production, distribution, installation and logistics of DCS projects.

New Attack Aircraft To Be Evaluated in Vietnam

The Air Force will send a squadron of A-37 jet aircraft to Vietnam this fall for test and evaluation.

Built by Cessna Aircraft, Wichita, Kan., the A-37 is a lightweight, twin-engine, subsonic, low-wing ground attack aircraft designed for close air support of ground forces, interdiction, and limited warfare.

The 604th Air Commando Squadron will conduct the test and evaluation. Accompanying the squadron will be data collection and test evaluation personnel working under the direction of the Tactical Fighter Weapons Center, Nellis AFB, Nev.

The team of analysts will gather information on manning, supply and maintenance procedures, survivability, and operational effectiveness for use in developing tactical air concepts, procedures, tactics and techniques for the use of the A-37 attack aircraft. After the test, the squadron will remain in the Special Air Warfare (SAW) force.

MEETINGS AND SYMPOSIA

OCTOBER

Second Electrofluiddynamic Energy Conversion Invitational Conference, Oct. 24-26, Wright-Patterson AFB, Ohio. Co-sponsors: Office of Aerospace Research—Aerospace Research Laboratories, and European Office of Aerospace Research. Contact: Lt. Dale Smith, (ARE), Aerospace Research Laboratories, Wright-Patterson AFB, Ohio 45433, Phone (513) 255-4309.

Conference on **Unguided Rocket Ballistics Meteorology**, Oct. 30-Nov. 1, at New Mexico State University, Las Cruces, N.M. Sponsor: U.S. Army Electronics Command. Contact: B. E. Britain, Atmospheric Sciences Office, Atmospheric Laboratory, USAECOM, White Sands, N.M. 88002, Phone (505) 338-1006.

NOVEMBER

1967 Conference on **Speech Communication and Processing**, Nov. 6-8, at Boston, Mass. Co-sponsors: Air Force Cambridge Research Laboratories and the Institute of Electrical and Electronics Engineers. Contact: C. P. Smith, (CRBS), Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Mass. 01730, Phone (617) 274-6100, Ext. 3712.

Applied Superconductivity Conference, Nov. 6-8, at Austin, Tex. Sponsors: Army Research Office, University of Texas, NASA, Air Force Office of Scientific Research and the Office of Naval Research. Contact: W. H. Hartwig, Electronic Materials Research Laboratory, University of Texas, Austin, Tex. 78712; or Lt. Col. R. B. Kalisch, (SREE), Air Force Office of Scientific Research, 1400 Wilson Blvd., Arlington, Va. 22209, Phone (202) OXford 4-5518.

Tenth Navy-Industry Conference on **Systems Effectiveness**, No. 8-9, Washington, D. C. Sponsor: Naval Air Systems Command. Contact: Executive Secretary, Naval Air Systems Effectiveness Advisory Board, Code AIR-5205A, Naval Air Systems Command, Washington, D. C. 20360, Phone (202) OXford 6-5284.

Navy Electronics Systems Classified Briefing (Secret), Nov. 14-16, U. S. Navy Amphibious Base, Coronado, Calif. Sponsor: Electronic Industries Assn. Contact: Electronic Industries Assn., 2001 Eye St. NW, Washington, D. C. 20006, Phone (202) 659-2200.

Decomposition of Organic Metallic Compounds to Refractory Ceramics, Metals and Metal Alloys Conference, Nov. 28-30, at the Sheraton-Dayton Hotel, Dayton, Ohio. Sponsor: Air Force Materials Laboratory. Contact: Dr. Lynch, (MAMC), Air Force Materials Laboratory, Wright-Patterson AFB, Ohio 45433, Phone (513) 253-7111, Ext. 54145.

Sixteenth Annual **Wire and Cable** Symposium, Nov. 29-Dec. 1, at the Shelburne Hotel, Atlantic City, N.J. Sponsor: Army Electronics Command. Contact: Milton Tenzer, Electronic Parts and Materials Div., Electronic Component Lab., Army Electronics Command, Fort Monmouth, N.J. 07703, Phone (201) 535-1834.

DECEMBER

Theory of Measurement of Atmospheric Turbulence Conference, Dec. 5-7, at Sandia Base, Albuquerque, N.M. Co-sponsors: Army Electronics Command and Sandia Corp. Contact: Marvin Diamond, Atmospheric Sciences Office, Atmospheric Sciences Laboratory, Army Electronics Command, White Sands Missile Range, N.M. 88002, Phone (505, 338-1006.

Industry-Defense Meeting, "**Industry Responds to National Emergency**," Dec. 7, Waldorf-Astoria Hotel, New York, N. Y. Co-sponsors: American Ordnance Assn. Eastern and Northeast Chapters. Contact: John S. Pink, American Ordnance Ass., 207 W. 24th St., New York, N. Y. 10011, Phone (212) OR 7-3030, Ext. 700.

DOD Procurement Conferences Scheduled

Three DOD Procurement Conferences of interest to small business and labor surplus areas will be held during the month of October. The Procurement Conference Program is part of DOD's continuing effort to develop additional competitive sources, large and small, to meet defense requirements.

The conferences are designed to provide:

- A single location for businessmen and potential contractors to become acquainted with the Federal procurement and contract process.
- Individual discussions with specialists on business opportunities in the Army, Navy, Air Force and Defense Supply Agency.
- Counsel on surplus sales and the activities of the Defense Contract Administration Service, the Defense Document Center, and other DOD organizations concerned with prime contracting and subcontracting.

Current Invitations For Bid and Requests for Proposals, including a number of "small purchase" ($2,500 and under) packages, will be available from Army, Navy, Air Force and Defense Supply Agency counselors at the conferences. In addition, a number of defense prime contractors, from the area contiguous to the conference site, will be available to discuss subcontract opportunities.

The dates and places of the conferences scheduled in October, including the individuals to contact concerning them, are:

Oct. 4—San Diego, Calif.
Contact:
John E. Harter
San Diego Chamber of Commerce
San Diego, Calif. 92101

Oct. 10—West Texas Area
Contact:
S. E. Burnett
Box 986
Kermit, Tex. 79745

Oct. 19—Louisville, Ky.
Contact:
James A. Beazley
Kentucky Department of Commerce
Frankfurt, Ky. 40601

DEPARTMEN

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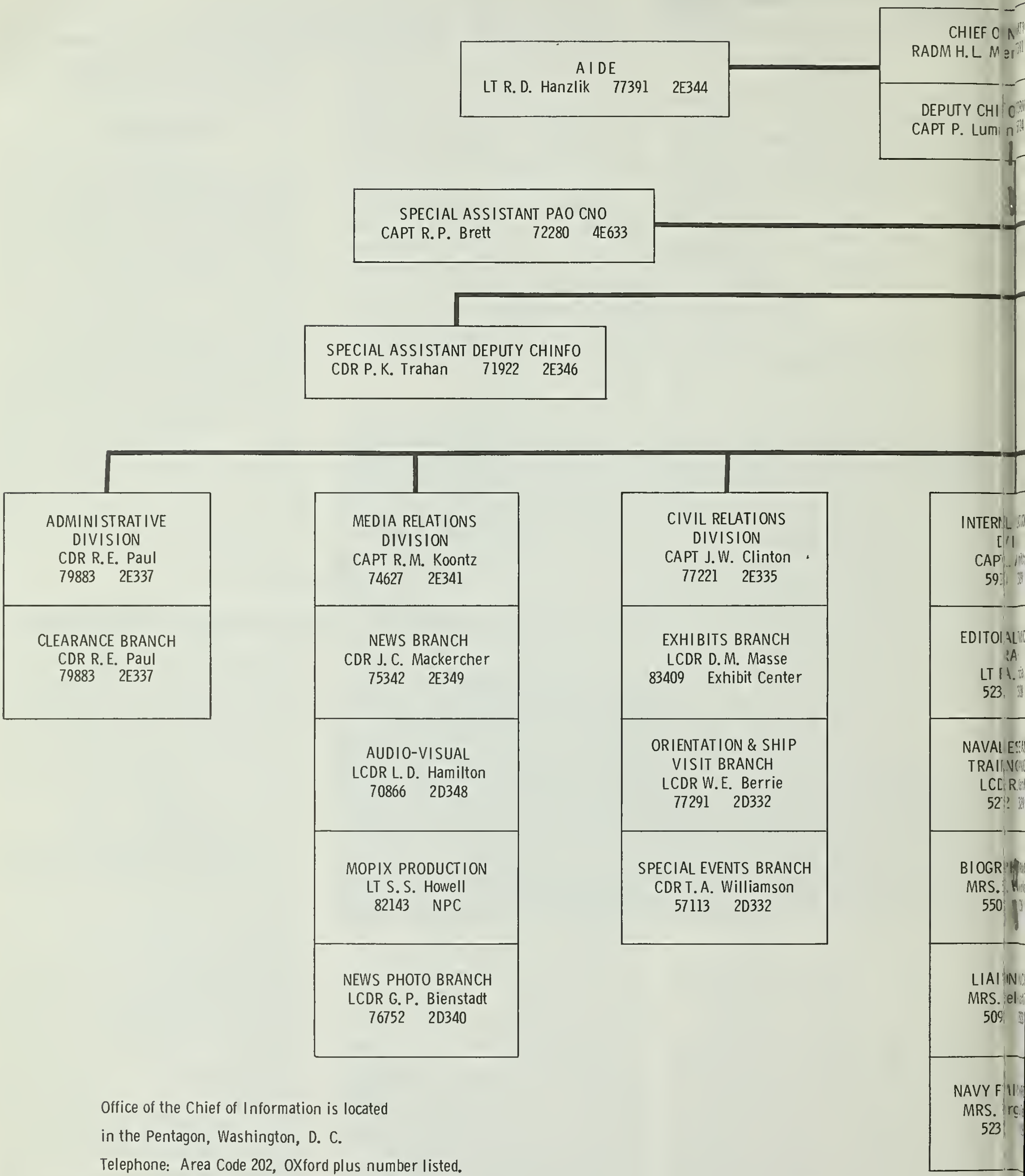

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75342 2E349

AUDIO-VISUAL
LCDR L. D. Hamilton
70866 2D348

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LT S. S. Howell
82143 NPC

NEWS PHOTO BRANCH
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CIVIL RELATIONS DIVISION
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EXHIBITS BRANCH
LCDR D. M. Masse
83409 Exhibit Center

ORIENTATION & SHIP VISIT BRANCH
LCDR W. E. Berrie
77291 2D332

SPECIAL EVENTS BRANCH
CDR T. A. Williamson
57113 2D332

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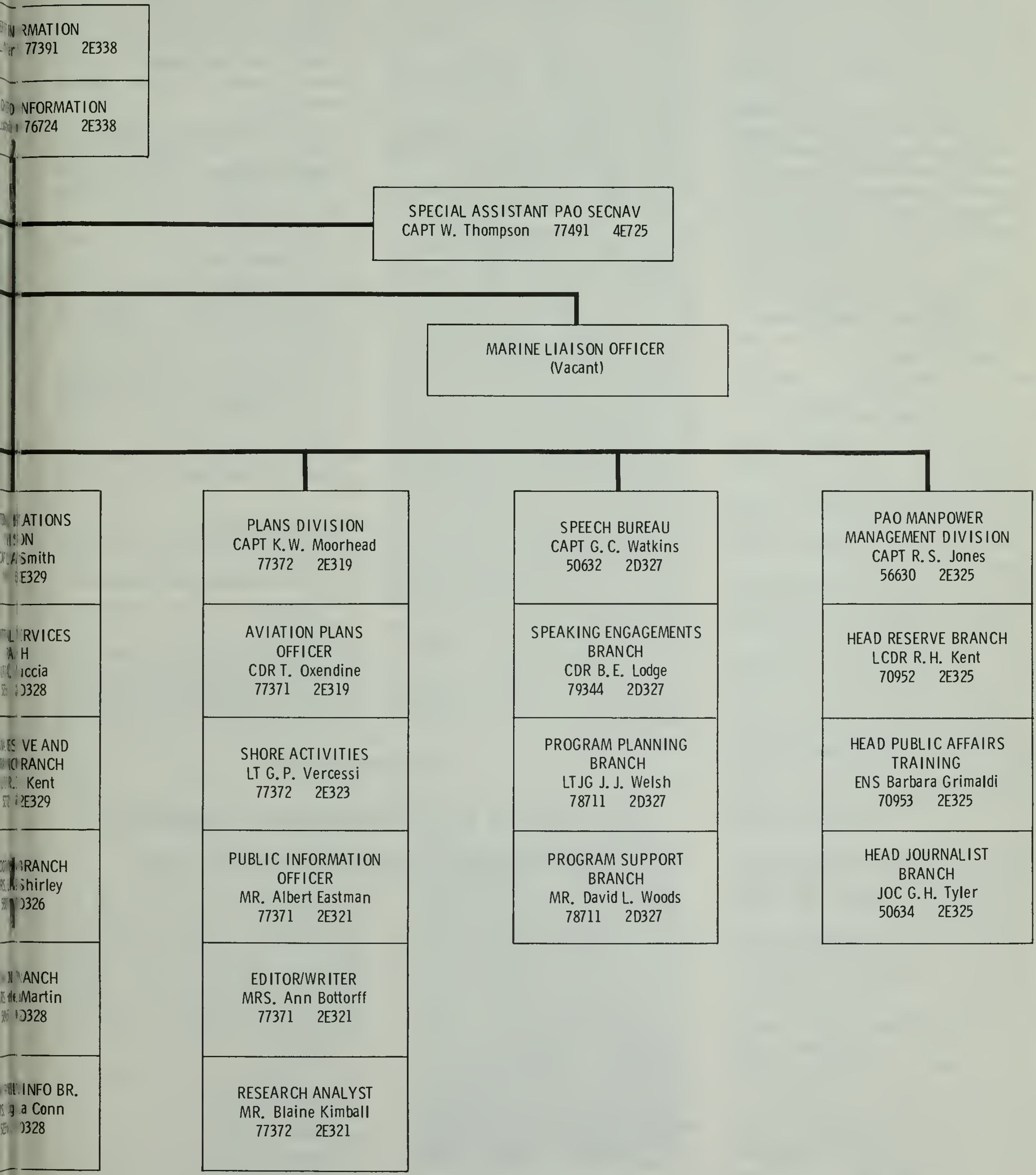
October 1967

THE NAVY
OF INFORMATION



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AVIATION PLANS OFFICER
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HEAD PUBLIC AFFAIRS TRAINING
ENS Barbara Grimaldi
70953 2E325

HEAD JOURNALIST BRANCH
JOC G.H. Tyler
50634 2E325

Calendar of Events

Oct. 3–6: National Defense Transportation Association-Annual Logistics Forum, Biltmore Hotel, Los Angeles, Calif.

Oct. 3–6: National Security Industrial Association Meeting, Washington, D.C.

Oct. 4: National AeroSpace Services Assn. Sixth Annual USAF Contract Aerospace Services Symposium, Imperial House North, Dayton, Ohio.

Oct. 4–5: American Ordnance Association (Value Engineering Div.) Meeting, Andrews AFB, Md.

Oct. 4–5: American Ordnance Association Annual Defense Preparedness Meeting, Jacksonville, Fla.

Oct. 9–10: Fifteenth Joint Engineering Management Conference, San Francisco, Calif.

Oct. 9–11: Association of the U.S. Army Annual Meeting, Sheraton-Park Hotel, Washington, D.C.

Oct. 9–11: Defense Supply Association Annual National Convention, Hilton Hotel, Washington, D.C.

Oct. 9–12: National Business Aircraft Association Meeting, Sheraton Boston and War Memorial Auditorium, Boston, Mass.

Oct. 10–12: Cleveland-Navy-National Security Industrial Association Scientific and Procurement Conference, Cleveland, Ohio.

Oct. 11–12. Institute of Navigation National Marine Navigation Meeting, Annapolis, Md.

Oct. 11–13: Army Aviation Association of America Meeting, Washington, D.C.

Oct. 16–17: Laser Range Instrumentation Seminar, Hilton-Inn, El Paso, Tex.

Oct. 16–18: Electronics and Aerospace Systems Technical Convention and Exposition, Sheraton Park Hotel, Washington, D.C.

Oct. 16–20: American Society of Civil Engineers Meeting, New York, N.Y.

Oct. 17–19: Lubrication Conference, Chicago, Ill.

Oct. 18–19: National Security Industrial Association Research and Development Symposium, Washington, D.C.

Oct. 19–20: National Conference on Fluid Power, Chicago, Ill.

Oct. 23–25: National Electronics Conference, Chicago, Ill.

Oct. 23–27: American Institute of Aeronautics and Astronautics Fourth Annual Meeting & Technical Display, Anaheim, Calif.

Oct. 24–26: Electronics Industry Association Meeting, Los Angeles, Calif.

Oct. 25–27: Electric Council of New England Meeting, Sheraton Hotel, Boston, Mass.

Oct. 26: American Ordnance Association Advanced Planning Briefing for Industry, Moline, Ill.

Oct. 29–Nov. 3: U.S. Civil Defense Council Meeting, Miami Beach, Fla.

Nov. 1–3: Northeast Electronic Research & Engineering Meeting, Sheraton Hotel and War Memorial Auditorium, Boston, Mass.

Nov. 1–4: Industrial Management Society Meeting, Chicago, Ill.

Nov. 13–15: Public Relations Society of America Twentieth National Conference, Bellevue-Stratford Hotel, Philadelphia, Pa.

Nov. 13–15: Conference on Electrical Techniques in Medicine & Biology, Statler Hilton Hotel, Boston, Mass.

Nov. 14–15: Technical Information Symposium, New York, N.Y.

Nov. 14–16: American Society of Tool and Manufacturing Engineers Regional Exposition, Sheraton Hotel and War Memorial Auditorium, Boston, Mass.

Nov. 14–16: Joint Computer Conference, Anaheim, Calif.

Nov. 15–16: Institute of Navigation Symposium on SST Operations, Seattle, Wash.

Nov. 26–Dec. 1: Radiological Society of North America, Chicago, Ill.

Nov. 28–Dec. 1: Wire and Cable Symposium, Atlantic City, N.J.

Dec. 3–9: Harvard College Advance Management Program, Statler-Hilton Hotel, Boston, Mass.

Dec. 4–6: AFL–CIO Biennial Conventions, Americana Hotel, Miami Beach, Fla.

Dec. 4–6: American Institute of Aeronautics and Astronautics Missile Systems Meeting, Monterey, Calif.

Dec. 5–9: American Nuclear Society Meeting, Chicago, Ill.

Dec. 6–7: Project Aristotle Conference, Washington, D.C.

Dec. 6–8: National Association of Manufacturers—72nd Congress of American Industry, Waldorf-Astoria Hotel, New York, N.Y.

Dec. 7: American Ordnance Assn. Area Industry Defense Meeting, Waldorf-Astoria Hotel, New York, N. Y.

Dec. 7–15: AFL–CIO Biennial Convention, Americana Hotel, Miami, Fla.

Dec. 14: Wright Memorial Dinner, Sheraton-Park Hotel, Washington, D.C.

Dec. 26–31: American Association for Advancement of Science, New York, N.Y.

Dec. 27–29: American Economic Association Meeting, Washington, D.C.

Dec. 27–30: American Statistical Association Meeting, Washington, D.C.

Electronics and Aerospace Systems Convention and Exposition Set

The 1967 Electronics and Aerospace Systems Technical Convention and Exposition, sponsored by the Aerospace and Electronics Systems Group of the Institute of Electrical and Electronics Engineers, will be held at the Sheraton Park Hotel, Washington, D. C., Oct. 16–18.

EASTCON '67 will present a varied technical program. In addition to regular sessions, three panel sessions are scheduled on "Command and Control," "Use of the Frequency Spectrum," and "All Digital Communications by 1980?"

The EASTCON exposition will feature a display of aerospace electronic hardware. The exhibits will embrace the full spectrum—systems, instruments and components—and are designed for the engineer, scientist and executive who represents industry and Government.

For registration and additional information the contact is:

EASTCON '67
Mr. E. J. Zillian
Western Electric Co., Inc.
1625 Eye St., NW
Washington, D. C. 20006
Phone: (202) 628–5443

FROM THE SPEAKERS ROSTRUM

Address by Hon. Robert A. Frosch, Asst. Secretary of the Navy (Research & Development), to the graduating class of the Defense Weapon Systems Management Center, Wright-Patterson AFB, Ohio, June 15, 1967.

Adam and Eve and Management

. . . I have the responsibility, for the Secretary of the Navy, of overseeing and generally controlling the work of project managers in the Navy. In the course of the past year I have been briefed by, and conversed with, many Navy project managers, and have had some opportunity to observe project management in the other Services. In large measure this experience has reinforced my previous views, and I would like to take this opportunity to tell you something about them.

To begin with, I may say that I consider management to be truly the oldest profession. I take biblical license for this view, believing that the first management instructions were those given to Adam and Eve concerning the management and operation of the Garden of Eden. The prototype administrative rule was "as for the Tree of Knowledge of good and bad, you must not eat of it." Characteristically this was not only the first instruction, but the first one that was violated. I imagine you are familiar with the consequences.

This was not only the first management instruction, but was a characteristic instruction; being phrased in the negative with consequences by implication. Perhaps the most difficult and least understood characteristic of the management problem is illustrated by this instruction. It is a characteristic of management rules and organization that far more attention is given to negative instructions, precepts and rules than to positive instructions on what the manager should do. The positive rules tend to come out clearly in favor of motherhood, God and country, whereas the negative rules are precise and definite. Managers are always abjured to be communicative, careful, economical, courteous, brave, clean and reverent on the positive side, whereas on the negative side it is generally explained to them in terms like "thou shalt not make cost-type contracts." This asymmetry persists in spite of the fact that management (as I conceive it) is: the art of arranging relations among people so that they are able to accomplish something. In spite of this basic underlying purpose, which is a "do," the asymmetry between general "do's" and specific "don'ts" always continues. . . .

It is reasonable to assume that there is some intrinsic difficulty in this asymmetry between the positive and the negative precept. I think that the asymmetry is connected with the difference between the past and the future, and the very nature of human life as an evolution into the future. The past is specific and definite, and what has happened has happened. The future that we are trying to construct is open, has infinite possibilities, and there is all sorts of room for creation and construction of new ideas. The negative precepts tend to embody advice against the mistakes of the past, whereas the positive precepts are attempts to construct the future better. As a result the negatives are precise, the mistakes of the past being well known, while the positives are not nearly so precise.

Neither the accomplishments nor the mistakes of the future are fully understood or well predicted. Thus, to my mind, the negative precepts embody guidance against what are believed to be the mistakes of the past, while the positive guidance tends to be general comments on what we hope will succeed in the future. As a result of all this, the great bulk of specific management injunctions (which are negative) are designed to prevent things from happening, whereas the generalizations, which are mostly positive, are the only things that give any guidance for what to do.

Hon. Robert A. Frosch

As a consequence, management instructions and administrative rules tie your hands, and most project managers seem to live in a perpetual struggle against other people's confining ordinances.

What is the End Objective?

Having defined management as being most interested in the positive arrangements for people, rather than in the negative prohibitions, I should like to talk to you now about the positive things that I think project managers should do. These are a result of my own observations of them as well as my personal experiences in being a project manager. I am afraid that I do not have a better crystal ball than others, so that I, too, will give positive generalities, but perhaps phrased from a different angle than the kind generally to be found in articles on management, and in that sense they may be of some assistance to you. . . .

The manager's main job is the construction of an end result. The real thing that we must try to do is to achieve the defined objectives. One difficulty that many managers have is connected precisely with this question: "What is the end objective?" The project manager is usually given (in the Navy at least) a Specific Operational Requirement (SOR) and a set of specifications.

Too many project managers begin by believing the SOR and those specifications to be the end objective. Unfortunately most of our specific operational requirements are not written in military terms. While they may be the result of a dialogue between military and the technological people (or of a trialogue between military, operational, technical and analytical people), they seldom come out written in terms of a military situation. They tend rather to express someone's ideas of the technical specifications to produce a device which will satisfy the requirements of the military situation that people had in mind, when they conducted the preliminary dialogues leading to the operational requirements. The specifications, of course, are merely an initial formulation of what should be achieved, and what everybody thinks could be achieved, during the course of the project.

Face to Face Dialogue

One of the nicest and commonest ways for a project manager to get into trouble is to believe that the SOR and the specifications are holy writ. Every Navy SOR has an escape clause that says: If you cannot meet the requirements of this document come back and talk some more. Nobody ever seems to use it. I urge you: at the beginning of your project initiate a dialogue with the operational people, and with the analytical people, so that you can steep yourselves in their feeling for the problem and they can become fully acquainted with your views on how to go about solving it. Please do not do this by initiating an exchange of letters or memoranda. Meet them face to face, talk with lots of operational and analytical people, have your staff participate, try to understand the problem from inside the minds of those who will have to operate the weapon. Keep doing this throughout the life of the project. This is time consuming, but I assure you it is more important than arranging for three-color slides for the TDP presentation to the Assistant Secretary. I will sense and be delighted by your intimacy with the military objective and how you plan to fulfill it. I see three-color slides many times during the day.

Let me put this requirement in the form of an aphorism:

> **The objective of the project is not the meeting of the specifications or the satisfaction of the operational requirement, but the solution to a military problem.**

This initial statement introduces you to two other important points: The most important characteristic of a project manager is knowledge and the only way he can achieve this knowledge is by direct contact with the people who have it. I do not wish to suggest that you should not read reports and letters, as well as write them, and study the basic subjects involved in what is being managed. By all means you should do so. I am not a believer in the fiction that there is a thing called management that can be operated independent of any knowledge about that which is being managed. I believe that is nonsense. A good manager may start without knowing much about the particular subject, but he will, in the course of his work, acquire knowledge of that which he is managing. Without knowledge of the subject at hand, he may PERT, cost, and milestone his way happily along for years without ever getting to the heart of his problem.

I sometimes worry that the technology of management is distracting us from the real job at hand. Stick with the people. The documents, the memoranda, the charts, the computer programs do not do anything in your project. Only the people actually take the actions, make the decisions, and cause the program to be a success or a failure. The rest of the machinery is, at best, some assistance to them and to you in doing so. Do not be mesmerized by the machinery.

The Virtue of Committee Operation

Because I believe so strongly in the importance of the people in project management, I find myself believing in the use of committees, *ad hoc* or permanent. It is not fashionable to believe in committees these days. We are continually being told that a camel is a horse designed by a committee. I should note that for some purposes, such as crossing deserts, I prefer the camel to the horse, always assuming that I cannot have an Israeli tank.

Please note that I include the individual as the unit case of the committee. By all means assign a job to a single individual and call him a committee, or to two, or to three, the number always depending on the nature of the job, and whether the people are good committee people or good individuals.

The virtue of committee operation is that it brings together people of different disciplines and temperaments to examine a common subject. Since all of our projects are multi-disciplinary, there is a good chance that more light may be shed by a group than an individual.

However, remember that the decision on the subject of the committee's deliberations should rightfully belong to you or to some other competent and suitable individual. The committee is best used as an advisory body and a deliberative body, rather than a decision-making body. The bad reputation of committees for arriving only at compromised solutions arises from misuse; the misuse of asking the committee to decide rather than to discuss, to devise ideas and, perhaps, to recommend. The skillful chairman will find his solution not necessarily in what the committee concludes, but in something that emerges in the course of deliberations.

Since you will use committees to advise and help you rather than to make conclusions, you can feel perfectly free about having nearly anyone on the committee—mixing the contractors, the headquarters staff, the laboratories and outsiders, as you choose. You need not be bound to give them precisely defined instructions and rules of conduct. Let them range freely over the material to use.

There are a number of books to be written on how to use committees in this way and nearly nothing sensible has come to my attention. If you can't figure out what to do, do some experimenting—an *ad hoc* committee can always be abolished. It may be painful to do so, but the committee members will know if they have failed and will probably suggest such a course of action to you. Most probably they will be enthusiastic about abolition.

Let me turn now from committees to some pitfalls and opportunities that you will face. As I have suggested, projects run on information, and the kind that arrives typed, mimeographed, or printed isn't good enough for a good manager. He should be using that only to tell him what information he really needs, and the information he really needs he will have to get by personal contact. Your most important basic information is, of course, who knows what about which, who you can trust, who will tell you without being asked, and who you should ask regularly. You can only find this out by paying attention to the people.

I do not generally sign things without reading them, but in a pinch I occasionally wish to, and I have a fairly good idea whose stuff it is safe to do this with, and whose I must really read in every case.

The Structure in which Information Moves

You must know that much about nearly everyone of importance in your project empire. In this regard you should realize, and certainly the military officers among you do, the distinction between the formal organization and the real organization. The formal organization, at any rate in the project and technological world, even in the Services, exists to define responsibilities, authorities, and the routes of paper that go with those defined authorities and responsibilities. The structure in which information moves, and in fact actions are taken, may be far different. You should be consciously aware of this, and use the informal and formal organization for their proper purposes. If you have the leeway, it is wise to reorganize your formal organization to fit the informal organization that develops, but you must be prepared to do this more than once at suitable intervals, generally following the rotation or change of a key man.

As a small digression, let me say that my belief in the existence and importance of the informal part of the organization is strong enough so that I have occasionally proposed using it as a basis for what I call stochastic reorganization. In this scheme one takes an organization that is not working well and proceeds to cut down its size by some arbitrary factor that must be chosen by judgment. Let us assume that the factor is one-half. In that case we make an alphabetical list of the people in the organization and flip a coin. If it comes out "heads" we start with number one; if it comes out "tails" with number two. What we do next is cross out the name of that individual (and this is the real key to it)—we abolish his job. We then tell everybody to go back to work, and sometime later, six weeks or six months depending on the organization's size and task, we examine what people are actually doing and relabel the organization diagram to conform. If the organization is still unsuccessful, perhaps we try the process again.

You will note that I have chosen a cut in personnel rather than an expansion. Most organizations suffer more from having too many people than from a shortage of people. I state this in spite of what project managers invariably tell me. Too much of the manpower is spent on doing formal jobs precisely instead of important jobs directly. When I see presentation charts or reports done in loathsome and unreadable detail instead of lucidly stating the main points, problems, and accomplishments, I am always reminded of Pooh-Bah's comment in "The Mikado" to the effect that "it was merely corroborative detail intended to add verisimilitude to an otherwise bald and unconvincing narrative." Someday I will have a sampler in my office that says, "Don't brief me, tell me what you know."

Returning to the formal and informal structures; use the informal structure for the real communication that it represents, reserving the formal structure for formal matters that put things into the record and deal with responsibility and authority.

At the same time if you are to succeed, you must be aware of two kinds of structural tendencies in bureaucracies. Both of these deal with human frailties and come about as a kind of amplification.

Amplification up the chain I call "management by rumor," and the Pentagon is very prone to it. A cold solder joint (or, I presume, a bad electron beam weld, these days) is discovered in the factory, and by some means someone outside the project, but reporting perhaps high up in the project chain (or even above the project manager), hears about it. Unless reasonable self-restraint is exercised, by the time the information gets to the project director or to me, or to the Director of Defense Research and Engineering, it becomes the kind of report that says: "Things are falling apart completely in the prototype construction, and a major management review is required."

Amplification Upward and Downward

Rumors are useful as sources of information, but it pays to track their background down carefully before starting a complete upheaval in the program. I suggest that information that comes via the informal organization should be checked via the informal organization before action is taken through formal channels. After being checked, it is frequently useful to have it regenerated through the formal system, and then replied to through the formal system, if indeed time permits for the formal steps. You can always document the whole thing for the record after you have fixed it.

The other amplification I simply refer to as amplification downward, and it comes about simply from the nature of the authority structure in a bureaucracy. I find that I must phrase my questions most carefully if catastrophe is not to ensue. The prototype case is the admiral who says to his chief of staff: "Say, Joe, whatever happened to Project X," expecting as an answer, "Oh that's going along very well, sir." Perhaps the chief of staff is not quite sure, and by the time the question has been passed down through several echelons the admiral finds himself listening to a two-hour briefing intended to allay his suspicions (which he never had) that the whole thing has fallen apart. A good deal of everybody's time and energy is wasted in this exercise.

There are two morals for the project manager. First: Beware of generating this flap yourself; make sure a simple question is labelled as such. Second: Don't get caught this way yourself. Do not be ashamed of going back to higher authority to find out precisely what he had in mind, particularly if the original question got filtered through a couple of echelons on the way. I, for one, would rather spend the time explaining what I actually was thinking about than use the time of an entire project to generate a briefing that I don't want to hear, and then have to hear it. When I want a briefing or set of facts I try to ask for them explicitly. (If you think I'm not explicit enough come tell me, or send me a note or something.)

Along this line of comment, I may say that you should try to distinguish clearly between the information that you require in order to run the project properly, and the information that you require in order to convince your superiors that you are running the project properly. The two are not necessarily the same, though they ought to be, and confusing them may lead you to spend more time on the latter than you should, while skimping on the former. As a result you sell better than you produce, and this is as fatal as producing better than you sell. Keeping the conscious distinction in mind may help.

These last few comments may be summed up under the general advice, "don't manage for management's sake," if you can avoid it—perhaps the regulations will not allow you to. Do not introduce management controls and information techniques unless you want to exercise the controls or use the information. You have to be somewhat foresighted in this. You may want information later in the project that had to be generated in the beginning, but think these sytsems out before you apply them.

Remember, management and information controls help you, but they may prevent the people who have to do the work from doing it well, imaginatively, or in some cases at all. If you introduce these things, and we all must, as we need them frequently, make sure that the people who must carry them out have plenty of opportunity (and know they have plenty of opportunity) to express their views on how to do them, as well as a chance to suggest other ways of accomplishing the objectives better, and in simpler and easier ways. Make sure they know there is an informal communication chain. They may be afraid to use the formal one.

In this regard it is frequently useful to know, in an informal way, people who are far enough down the chain (or outside of it) in useful places that you cannot know them at all formally. The nature of the informal communication chain needs some building sometimes, although usually it is well adjusted by the nature of people. The worst thing that can happen to you is for you and your principal assistants to be outside of the informal chain entirely.

To a large extent the purpose of Special Assistants to an Assistant Secretary is to constitute a formal recognition of the fact that it is difficult for the Secretary to have informal access to the informal chain. Consequently he has assistants who, in fact, really are part of the informal communication system. The aides to admirals and secretaries also constitute an informal communication channel which has its uses. You might think about purposely, but discreetly and carefully, constructing similar arrangements.

So far I have been trying to help you to get things going and keep them going in a good and successful way. What about the case where somehow or other you have gotten into trouble? Perhaps it is real technological trouble that could not be anticipated. Perhaps it is a kind of external "act of God" trouble in the contract or elsewhere. Perhaps it is the result of a slip in management.

Tell the Boss When There is a Problem

My particular concern at the moment is not how you go about fixing it, but what you do or don't do about letting other people know there is trouble coming or that trouble is here. Don't be afraid to tell the boss there is a problem. Remember, it's his neck, too Maybe he can help; certainly, he will want to help. At the very least, even if it turns out that you made the trouble yourself, you will get credit for having the sense to know that you are in trouble.

There is nothing more disturbing and annoying to everyone involved than for the superior to find out that there is serious trouble long after it would have been easy for him to help with instructions, with contacts only he can make, sometimes even with money, manpower, and outside help. After all, if you ask him for help and he doesn't give it in a useful way that makes him a part to the crime.

Again, as a superior, don't manage for management's sake. I mean this now not in terms of introducing unnecessary techniques, to which I previously referred, but in terms of bothering the people who are working when you don't need to. You must know who to leave alone, when, and how long, and when to bother them again. Nothing but knowledge of the people will tell you this.

Sometimes the most useful way to make things happen is not to take action, but to make it very clear that the management exists, that it is interested, that it wants information, and that it expects something to be done. It may not even be necessary to direct what is to be done, but only to ask for information on the status, to trigger a good deal of exercise in the system. Be careful not to let this lead you into eruptions of amplification downwards.

With regard to these matters of relationship with your superiors, one great defect of the project management system is that project managers, indeed many of their staff members, tend to identify after a while with their product. Sometimes they even identify very closely with manufacturers or laboratories producing the product, when instead they are supposed to be controlling them. Try to preserve a certain detachment from your job. It is true that you will have to be the main defender of the project, but if you identfy only with its successful conclusion and end result, you will not be able to carry out one of the important functions of the project manager, *i.e.*, the identification of intrinsic failure of either the whole project or an approach in it.

Identifying that all or part of this project is on the wrong track and needs to be cancelled, changed markedly, slowed down, reduced in funding, or increased in funding is the most important job for a project manager. If he identifies himself with the success of the product only as being his success, he cannot possibly carry out this job.

Captain Swede Momson, who was, before his retirement, a very successful guider of research in the Office of Naval Research, had for a long time a sign on the wall of his office that said, "The most important thing in research is the recognition and prompt burial of a dead horse."

The project manager must realize that his success may come from a recognition that a horse is dead or dying for reasons extrinsic to his own actions. Certainly, telling me, as the manager of Navy research, development, test and evaluation (RDT&E), and of the budget for that RDT&E, that something cannot be done, or is unwise, or would not fulfill the basic objective, is as great a service to the Navy and the country as producing an article that is possible. It is certainly a greater service than struggling on, spending time, energy and money trying to produce the impossible or unwise.

I would like to quote just one maxim that I think is most important, although it does not quite fit in with any of the things I have previously said. "Do not assume that the obvious has been done, everybody else is assuming that too."

In closing, let me return to my definition of management in terms of arranging things so that people can work. You should think of yourselves as something akin to a symphony orchestra conductor, to a ballet master, to the director of a stage production. You are conductors, leaders, in several senses manipulators of people. The management tools that you have learned are like the notation of music, the characteristics of the instruments, and the forms of the dance, or the script, or the notation of stage directions of a play. The important task is arranging things so that the people perform together with themselves, and with you, to do the job.

When the weapon is in the Fleet, the Army, or the Air Force, no one will read the TDP or review the PERT charts. They will want to know whether it helps in preserving the security of the nation. Your end result is what you and your teams have done, not the precise means by which you have done it.

OCD Urges Fallout Shelter Planning in New Buildings

The Office of Civil Defense (OCD), Department of the Army, has launched a new program designed to encourage architects and building owners to incorporate potential fallout shelter space in the initial design of new buildings.

Under the program, letters have been sent to building owners and architects, who are planning new construction projects, urging inclusion of fallout protection in the initial design.

To facilitate the inclusion of fallout protection in new buildings, OCD has developed a cost-reduction shelter-design techniques plan, which can be applied to structures without materially changing the building's appearance or function.

Examples of shelter cost-reduction design techniques are: reducing window areas and raising sill heights; judicious use of retaining walls and planter boxes; grading slope away from building; partially depressing buildings into the ground; arranging building modules to provide a protected core; filling hollow walls with sand or gravel; and many others.

The program will be started in Arizona, Florida, Louisiana, Massachusetts, Tennessee, Texas and Wisconsin. All schools to be constructed in the initial seven states will be included. Only owners of such other buildings as those valued at $200,000 or more, without basements, and $100,000, with basements, will be contacted.

The OCD has already located shelter for more than 159 million people in existing buildings. By use of modern low-cost shelter design techniques, it is possible to create additional shelter space for millions of others.

DOD Instructions and Directives Now Available Through Subscriptions

All new and revised DOD directives, instructions and changes (except those marked "For Official Use Only") are now available on a subscription basis.

For six dollars a year, subscribers will automatically receive one copy of each new issuance in the subject group requested. Subscriptions will be for a single major subject group. Additional subject groups will cost six dollars each.

Available subject groups are:

1000—Manpower, Personnel and Reserve
2000—International Programs
3000—Planning and Readiness
4000—Logistics and Resources Management
5000—General Administration
6000—Health and Medical
7000—Comptrollership
INDEX—Quarterly Listing of DOD Unclassified Issuances and Subject Index

Subscription requests should be forwarded to Director, Navy Publications and Printing Service Office, (Attn: Code NPA–1), Building 4, Section D, 700 Robbins Ave., Philadelphia, Pa. 19111, accompanied by a certified bank check or postal money order payable to the Treasurer of the United States.

The subscription service pertains only to the release of new and revised DOD documents. Previously published individual DOD directives and instructions, listed in the Quarterly Listing of DOD Unclassified Issuances and Subject Index, will be available without charge, one copy per request, from the Naval Supply Depot, Code 300, 5801 Tabor Ave., Philadelphia, Pa. 19120.

SELECTED DEFENSE DEPARTMENT ECONOMIC INDICATORS

(Dollars in Millions; Manpower in Thousands; Quarters by Calendar Year)

	1966 I	II	III	IV	1967 Jan	Feb	Mar	I	Apr	May	Jun	II	Jul
I. Military Prime Contract Awards													
Aircraft	$ 1,945	$ 2,989	$ 2,696	$ 2,262	$ 784	$ 788	$ 530	$ 2,102	$ 432	$ 1,240	$1,377	$ 3,049	$ 467(p)
Missile & Space Systems	1,040	987	1,314	861	380	361	489	1,230	300	260	606	1,166	402(p)
Ships	355	491	876	239	90	418	171	679	72	129	206	407	145(p)
Weapons & Ammunition	555	1,486	692	940	346	215	257	818	279	518	972	1,769	209(p)
Electr. & Communications Eqpt.	918	1,574	666	915	377	265	329	971	480	338	1,030	1,848	154(p)
Other Hard Goods	843	1,842	660	1,029	267	305	343	915	298	362	904	1,564	144(p)
Soft Goods	709	922	1,078	989	251	193	194	638	171	199	282	652	591(p)
Construction	207	392	198	150	106	59	67	232	126	160	340	626	72(p)
All Other	1,406	1,963	2,356	1,639	534	575	496	1,605	517	507	963	1,987	1,178(p)
Total (Excl. of work outside U.S.)	7,978	12,646	10,536	9,024	3,135	3,179	2,876	9,190	2,675	3,713	6,680	13,068	3,362(p)
Total, Seasonally Adjusted	8,703	10,144	10,716	10,149	3,338	3,849	2,984	10,171	2,920	4,121	3,626	10,667	3,561(p)
Work Outside U. S.	521	1,195	856	672	183	112	158	453	227	228	379	834	320(p)
II. Gross Obligations Incurred													
Operations	8,326	9,604	10,426	9,702	3,495	3,226	3,508	10,229	3,664	3,531			
Procurement	4,374	8,539	5,368	5,276	1,738	1,451	1,924	5,113	1,801	2,485			
Other	2,429	3,470	3,453	2,230	823	774	922	2,519	726	1,130			
Total	15,129	21,613	19,247	17,208	6,056	5,451	6,354	17,861	6,191	7,146			
III. Gross Unpaid Obligations[1] *Outstanding*													
Operations	3,828	3,777	4,792	5,024	5,041	4,892	4,644	4,644	4,761	4,765			
Procurement	18,023	22,119	22,736	23,173	23,134	22,982	22,780	22,780	22,613	22,947			
Other	5,747	7,392	8,179	7,888	7,858	7,834	7,626	7,626	7,453	7,628			
Total	27,598	33,288	35,707	36,085	36,033	35,708	35,050	35,050	34,827	35,340			
IV. Net Expenditures													
Operations	7,689	9,076	8,968	9,087	3,267	3,219	3,516	10,002	3,416	3,335	3,745(p)	10,496(p)	
Procurement	3,651	3,886	4,392	4,264	1,680	1,491	1,903	5,074	1,783	1,850	1,702(p)	5,335(p)	
Other	2,757	2,647	2,484	3,092	1,015	887	1,277	3,179	918	749	399(p)	2,066(p)	
Total	14,097	15,609	15,844	16,443	5,962	5,597	6,696	18,255	6,117	5,934	5,846(p)	17,897(p)	
V. DOD Personal Compensation													
Military	3,181	3,249	3,551	3,606	1,200	1,221	1,203	3,624	1,230	1,196			
Civilian	1,937	2,015	2,105	2,135	733	666	764	2,163	700	776	766(p)	2,242(p)	724(p)
Total	5,118	5,264	5,656	5,741	1,933	1,887	1,967	5,787	1,930	1,972			
VI. Outstanding Payments													
Advance Payments	66	79	90	83				92				80	
Progress Payments	4,402	4,346	4,750	5,461				5,981				6,765	
V Loans	53	51	52	55				112				64	
Total	4,521	4,476	4,892	5,599				6,185				6,909	
VII. Strength (Manpower)													
Military	2,969	3,094	3,229	3,334	3,357	3,368	3,371	3,371	3,371	3,368	3,377	3,377	
Civilian	1,088	1,138	1,184	1,230	1,246	1,260	1,268	1,268	1,273	1,274	1,303	1,303	1,311(p)

p—preliminary.

[1] Revised through May 1967 to exclude unpaid obligations involving revolving and management funds so as to be compatible with coverage pertinent to the "Gross Obligations Incurred" indicator.

NOTE: Open spaces for Indicators other than No. VI indicate information not available at time of publication. Indicator No. VI information available only on a quarterly basis.

Directorate for Statistical Services
OASD/Comptroller
30 August 1967

Project THEMIS

Thirty Universities To Do Research Projects for DOD

Fifty research programs have been selected by the Defense Department to be performed at universities located in 30 states and the District of Columbia under Project THEMIS during the 1967-1968 academic year.

Project THEMIS was initiated in January 1967 to develop new centers of excellence capable of solving future defense problems, and to provide wider geographical distribution of defense research funds.

All research programs under Project THEMIS, which has an initial funding authorization of about $20 million, will be unclassified. Funds for continuation of Project THEMIS support of the 50 pioneer programs and for an additional 50 programs have been requested by DOD for FY 1968.

Project THEMIS research centers and the titles of projects to be performed are listed below:

Detection, Surveillance, Navigation and Control

Georgetown University. Laser Technology.

University of Florida. Solid State Materials.

Iowa State University. Auto Navigation and Controls.

University of Kansas. Remote Sensing Instrumentation.

University of Minnesota. IR Detector and Laser Technology.

University of New Mexico. Radiation Effects on Electronics.

John Carroll University. Laser and Ultrasonic Radiation.

Ohio University. Low Level Navigation.

Oklahoma State University. Electronic Description of Environment.

Texas A&M University. Optimization Research.

Southern Methodist University. Automatic Navigation.

University of Virginia. Learning Control Systems.

Energy and Power

University of California at San Diego. Transport Phenomena in Flow Systems.

University of Delaware. Fluid Mechanics and Heat Transfer.

Florida State University. Geophysical Fluid Dynamics.

University of Minnesota. Gas Turbine Technology.

University of Missouri. Fluid Transport Properties.

University of Tennessee. Dynamic Sealing.

University of Utah. Chemistry of Combustion.

Information Sciences

Auburn University. Information Processing.

University of Florida. Logistics and Information Processing.

Louisiana State University. Digital Automata.

Dartmouth College. Time Shared Computing Systems.

Case Institute of Technology. Research on R&D Management.

University of Houston. Information Processing Systems.

Military Vehicle Technology

Georgia Institute of Technology. Low Speed Aerodynamics.

Notre Dame University. Deep Sea Engineering and Aerodynamics.

University of Massachussetts. Deep Sea Submersibles.

Mississippi State University. Rotor and Prop Aerodynamics.

Rutgers University. Separated Flow.

Material Sciences

Georgia Institute of Technology. Interface Phenomena.

Iowa State University. Ceramic Materials.

Stevens Institute. Nonlinear Physics of Polymers. Cryogenic Science and Engineering.

North Carolina State University. Materials Response Phenomenon.

Environmental Sciences

University of Hawaii. Astronomy Research.

University of Nevada. Cloud Physics.

New Mexico Institute of Minerals & Technology. Environmental Sciences.

SUNY—Albany. Modification of Environment.

Oregon State University. On Line Computer Environmental Research.

South Dakota School of Mines. Modification of Convective Clouds.

Texas A&M University. Meteorology Research.

Medical Sciences

Indiana University. Environmental Hazards.

Louisiana State University. Infectious Communicable Disease.

SUNY—Buffalo. Environmental Physiology.

University of Alaska. Human Ecology.

Social and Behavioral Sciences

Arizona State University. Human Performance in Isolation.

Kansas State University. Performance in Altered Environments.

University of Kansas. Social and Behavioral Sciences.

Texas Christian University. Human Pattern Perception.

Contract Administration

(*Continued from page 12*)

cycle. Similarly, many of these problems did not arise simply because of DCAS. The creation of a unified contract administration organization has highlighted problems of long standing; problems that could not even be clearly identified, much less resolved, as long as contract administration efforts were fragmented throughout DOD.

The contract administration components are making real progress toward the four objectives of Project 60: improved management of defense contracts, improved responsiveness to both buyers and producers, elimination of duplicate effort, and reduced operating costs.

Contract administration has indeed come into its own. The ACO, whose functions include vital advice and assistance in the formulation as well as in the administration of contracts, is as a co-equal member of the procurement team.

New Suppliers Sought by Defense Supply Agency

The following is a list of items, procured by the Defense Supply Agency, in which not more than two bid or proposals were received on the last procurement, or in which additional production capability is required.

In some cases competition has been limited because of the need for specialized facilities or capabilities and lack of specifications. For most items there are no known major factors which should inhibit additional competition.

Firms interested in competing in any future procurement of these items should contact the Small Business and Economic Utilization Specialist at the Defense Supply Agency center concerned.

For applicable Military and Federal Specification to these items, request should be made to the Commanding Officer, U.S. Naval Supply Depot (Code DC–1), 5801 Tabor Avenue, Philadelphia, Pa. 19120.

Explanation of asterisks in the listing is as follows:

*These items are to be manufactured in accordance with various Military and Federal Specifications and various drawings. Applicable specifications and drawings will be specified on individual solicitations.

**Purchase Descriptions (P/D) and Drawings are available at Defense Personnel Support Center.

DEFENSE CONSTRUCTION SUPPLY CENTER

Ralph H. Sager
Small Business & Labor
Surplus Specialist
Defense Construction Supply Center
Columbus, Ohio 43215
Phone: (614) 236–3541

Item	Specification
Bag, Water Sterilizing	MIL–B–273
Dusters	RR–D–780
Fire Extinguisher, Water, 5 Gallon (MS–39082)	MIL–E–212
Fog Generator, Insecticide	MIL–F–898
Fumigation Kit, Portable	MIL–F–54000
Heater, Space, Size 2, w/Air Circulating Fan	MIL–H–14516A
Pump, Dispenser, Hand Driven	MIL–D–43095
Sprayer, Duster, Trailer Mounted	MIL–S–23923
Sprayer, Insecticide, Type III, Class 1, Size 2	RR–S–626
Sprayer, Insecticide, 2 gallon	MIL–S–23923
Water Purification Units	MIL–W–52116 & MIL–W52027
Winch, 3 Drum, Diesel Engine	MIL–W–82065

DEFENSE ELECTRONICS SUPPLY CENTER

B. L. Castle
Small Business & Labor
Defense Electronics Supply Center
Dayton, Ohio 45401
Phone: (513) 252–26218

Item	Specification
Coil, FSN 5965–636–1761	*
Coil, Visual, Indicator, Assembly, TA–1 Telephone Set, Signal Corps Dwggs SMC–189366 and SMC–169023	*
Connector Plug, FSN 5935–815–2325, Type MW–10M (M)D17	MIL–C–55181
Connector Plug & Receptacle, FSN 5935–673–8380, Liquidometer Corp. Part No. B229–5	*
Cover, FSN5965–562–8933	*
Cover, Protective, Made by American Electronics Co. Part No. B23–209, Revision E	*
Cushion, FSN–5965–6980429	*
Cushion, Earphone, left hand, JCENS Type MX2088/U	*
Electron Tube, FSN 5960–0603450, Mil Type 3B29W	*

Item	Specification
Electronic Tube, FSN 5960–067–9364, Type 8370	*
Electron Tube, Types 5J26, 5R4WGB, 4J38, 6116, 817OW, 3B24WB, 2C46, 8252 and 5948A	*
Electron Tube, Klystron, Types 2K45 and 2K48	*
Electron Tube, Magtron, Types 2J50 and 2J51A	*
Electron Tubes, Types 6299, 6Y6GT, 7077, 7289 and 2K25	*
Generator, Handset, Telephone, in Accordance with Signal Corps Dwg 189375, Revision A	*
Handset, Battery Powered, Type H–67A	*
Headset, FSN 5965-548–4287	*
Loudspeaker, FSN 5965–243–0207	*
Loudspeaker, Permanent, Magnet, Type 1S–215/U, Signal Corps Dwg SC–DL–98482	MIL–L–13073
Microphone Cover, CW292U in Accord with Signal Corps Dwg SC–B–84239	*
Microphone Element, FSN 5965–698–0421	*
Mike, FSN 5965–698–0422	*
Potentionmeter Assembly, FSN 5905874–1798, O-zone Metal Dwg/Spec 220262–2	*
Receptacle, Quick Disconnect, FSN 5935–6 673–8388, Liquidometer Corp. Part No. B–298–5	*
Relay Assembly, FSN 5945–758–0977, Garrett Part No. 199960–6	*
Relay Armature, FSN 5945–069–6209	*
Register, Variable, Assembly, Army Missile Cmd Dwg 9053894	*
Register, Variable, Assembly, Topp Dwg 17609	*
Register, Variable, Assembly, Western Electric Dwg BL47537	*
Register, Variable, Assembly, Topp Dwg 18049	*
Register, Variable, Assembly, Ace P/N 162C–348	*
Register, Variable, Assembly, Ace P/N APO 8C5–1	*
Register, Variable, Assembly, Lear Siegler Dwg 600744–01	*
Register, Variable, Assembly, Ace P/N APO 8C5–1 IAW ITT Dwg 1065725	*
Register, Variable, Assembly, Ace P/N APO 5–C313–12 IAW GPL Dwg 121–631–003	*
Register, Variable, Assembly, Ace PN X500 IAW Motorola Dwg 18–14119A10	*
Register, Variable, Assembly, Ace P/N Ace Set 100K	*
Switch, FSN 5930–749–8964, White Diesel Dwg A115–620 per LSD–HR–41–63	*
Transformer, Power, FSN 5950–522–0851, GE Catalog No. 70G458, PIN 70G 458, GE Part No. 9T39Y4001	*

DEFENSE GENERAL SUPPLY CENTER

W. Reed Randolph
Small Business & Labor
Surplus Specialist
Defense General Supply Center
Richmond, Va. 23219
Phone: (703) 275–3617

Item	Specification
Aircraft Cockpit Light, FSC 6220	MIL–L–6484B
Can, Water, FSC 7240	MIL–C–13984
Chaplin Kit, FSC 9925	MIL–C–43175, MS–16657, and MIL–C–43237
Charcoal, Activated	MIL–C–506
Chemicals, Photo FSC 6750	*
Cup, Paper, FSC 7350	UU–C–814A, UU-C–812A, and UU–C–815A
Cylinder, Gas, FSC 8120	*
Distress Marker Lights	MIL–L–23614A
Drum, Fabric, 500 Gallon, FSC 8110	MIL–D–23119A

Item	Specification
Electric Safety Lanterns	Various Part Numbers or Equal
Flashlight, FSC 6230–MX991, MX993, MX212	MIL–F–3747A
Floodlights	MIL–F–17696B and MIL–F–1712B *
Film, Photo, Aerial, B–W, FSC 6750	*
Film, Photo, FSC 6750	*
Gasoline Lanterns	MIL–L–1594D
Insular Strain FSC 5970	*
Light, Marker, Distress, FSC 6230	MIL–L–583D and MIL–L–23614A
Lighting Fixtures	W–F–00414B and MS19107
Magnesium Powder, FSC 6810	JAN–M382A and MI–P–14067A
Opener, Hand, Can, FSC 7330	FF–O–00605
Paper, Photo, FSC 6750	*
Sewing Machine, Industrial, FSC 3530	OO–S–256C
Steel Strapping, FSC 8135	QQ–S–781E
Tape, Pressure, Sensitive, Adhesive, FSC 8135	*
Terminal Boxes	Various Drawings

DEFENSE INDUSTRIAL SUPPLY CENTER

Sidney Charles
Small Business & Labor
Surplus Specialist
Defense Industrial Supply Center
700 Robbins Ave.
Philadelphia, Pa. 19111
Phone: (215) 697–2747

Item	Specification
Block & Tackle, Slings, FSC 3940	*
Electrical Wire and Cable, FSC 6145	*
Fibre Rope, Cordage and Cotton, Twine, FSC 4020	*
Fittings for Rope, Cable and Chain, FSC 4030	*
Molded Rubber Products, FSC 5330	*

DEFENSE PERSONNEL SUPPORT CENTER

Samuel R. Todd
Matthew E. Kryston
Hubert L. Smoczynski
James L. Calvert (Subsistence)
Small Business & Labor
Surplus Specialists
Defense Personnel Support Center
2800 South 20th St.
Philadelphia, Pa. 19101
Phone: (215) 271–2623; 271–2638; 271–2728 or 271–2704

Clothing & Textile

Item	Specification
Boot, Flying, Impact Resistant	MIL–B–21408
Buton, Insignia, Metal	MIL–B–3461
Coat, Fireman's, OG–107	MIL–C–10750E
Coveralls, Safety, Heat Protective	FAC/NS 634
Gloves, Protective, Fire Fighters	MIL–G–27339
Gloves, Toxicological, Butyl Rubber	MIL–G–12223
Helmet, Combat, Vehicle Crewman's	MIL–H–43059
Hood, Fireman's Asbestos	MIL–H–25630
Mask, Surgical, Fibrous Glass, Disposable	MIL–M–36431
Mask, Surgical Gauze	DDD–M–136
Mask, Surgical, Non Woven, Disposable	MIL–M–36168
Mattress, Bed, Foam, Rubber	MIL–M–18351
Overshoe, Man's, High Black	MIL–O–836
Raincoat, Women's, Coated Nylon AF	MIL–R–38252
Shoe, Dress, Women's	MIL–S–21711
Suitcase, Cotton Duck	USAF Dwg SZK6757
Sweatpants, Silver Grey	BBB–S–860A
Trousers, Safety, Heat Protective, Asbestos MB–1A	MIL–T–4633

Medical**

Bath, Parafin	P/D#7, 27 Sep 66
Blade, Laryngoscope, Infant, MacIntosh 87mm	P/D#1, 21 Feb 66
Blade, Laryngoscope, Large Adult, MacIntosh, 158mm	P/D#1, 21 Feb 66
Box, Microscope Slide, Plastic, 100 Slide	P/D#2, 20 Jan 66 NNN–B–00585 (DSA–DM)

Item	Specification
Cannula, Uterine, Corrosion Resistant Steel	P/D#2, 17 Apr 64
Dispenser and Counter, Narcotic Capsule Tablet	P/D#2, 28 Oct 64
Impression Material, Dental, Hydrocolloid, Alginate Type	P/D#5, 25 Oct 65
Locater, Radiographic, Ocular, Foreign Body	P/D#4, 1 Apr 66 and GG–L–56A 29 Oct 60
Reamer, Medullany Canal, 10mm diameter	P/D#4, 8 Jan 66
Reamer, Medullany Canal, 9mm diameter	P/D#4, 8 Jun 66
Resin, Acrylic, Denture Base Repair, Pink, 250 gm	P/D#12, 28 Feb 67
Stapcock, Intravenous Therapy, 3 way Plastic, Disposable 50s	P/D#4, 6 Oct 64
Suction and Pressure Apparatus, Surgical, Explosion Proof, Single Compressor, Mobile	P/D#11, 26 Jan 67
Tube, Blood Collecting, Vacuum, Sterile, with Anti-coagulant 50s	P/D#13, 23 Oct 65, MIL–T–36191, 12 Jan 65
Subsistence	
Bacon, Prefried, 22 oz. can	MIL–B–35032
Bread, Canned	MIL–B–1070D
Fish Squares, Dehydrated	MIL–F–43142
Ham, Slice & Fried, 5-1/2 oz. can	MIL–H–1071
Ice Cream Mix, Type I, Dehydrated	MIL–I–705
Juice, Orange, Instant	MIL–J–35049
Peppers, Green, Dehydrated, 2-1/2 cans	MIL–P–35003
Pork Steak, 5-1/2 oz. can	
Pork Chops, Dehydrated, Raw, 307 & 710 can	MIL–P–43144
Pork Sausage, Canned, Links	MIL–P–1104 MIL–P–1069
Pork Steak, 5-1/2 oz. can	MIL–S–1049,
Soup, Dehydrated	MIL–S–3059, MIL–S–35046, MIL–S–35051 and MIL–S–3271

An engineer of the Air Force Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio, demonstrates the lift capability of the rectangular para-foil parachute. The para-foil, equipped with on-board guidance and control units, is being tested by the laboratory for accurate delivery of cargo. Designed to be guided to a pinpoint landing, it can glide nearly three feet horizontally for each foot of vertical drop. The steerable parachute will deliver 2,000 pounds of cargo dropped from aircraft at speeds of 130 knots at altitudes of 15,000 feet. Harley Walker is project engineer for laboratory tests of the para-foil.

The X-24A, designed and built by the Martin-Marietta Corp., Baltimore, Md., is the Air Force's newest flight research vehicle. It will be used in the forthcoming Piloted Low-speed Tests (PILOT) Project directed by the Air Force Systems Command's Aeronautical Systems Division (ASD), Wright-Patterson AFB, Ohio. The purpose of the project is to develop technology to support future requirements for a manned, lifting body reentry vehicle capable of returning from space and landing at a designated site of the pilot's choice. Douglas E. Ringwall is ASD's program manager for the X-24A and the PILOT project.

BIBLIOGRAPHY

RESEARCH REPORTS

Authorized DOD contractors and grantees may obtain these documents without charge from:

Defense Documentation Center
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Stilbene Spectrometer for Neutrons and Gammas: Electronics and Related Performance. Ballistic Research Laboratories, Aberdeen Proving Ground, Md., for the Defense Atomic Support Agency, Sept. 1966, 165 p. Order No. AD–644 448. $3.

Higher Order Elastic Coefficients for Crystals: The Third-Order Elastic Stiffness. Army Electronics Command, Fort Monmouth, N.J. Aug. 1966, 23 p. Order No. AD–642 844. $3.

New Concepts in the Physics of Solids, a Monograph. Air Force Cambridge Research Laboratories, L. G. Hanscom Field, Mass., Aug. 1966, 94 p. Order No. AD–645 890. $3.

Beta Spectra V. Spectra of Individual Positron Emitters. Naval Radiological Defense Laboratory, San Francisco, Calif., Nov. 1966, 134 p. Order No. AD–646 228. $3.

A Fortran IV Program to Derive the Equations of Motion of Systems. Air Force Flight Dynamics Laboratory, Wright-Patterson AFB, Ohio, Sept. 1966, 130 p. Order No. AD–648 720. $3.

Study of Alumina Crystal Structures (Automation of the Verneuil Process). University of Michigan, for the Air Force, March 1967, 25 p. Order No. 649 161. $3.

Measurement of the Velocity Distribution Function of a Gas Using A Laser. Stanford University, for the Navy, May 1966, 78 p. Order No. AD–638 795. $3.

Some Factors Affecting the Growth of Beta Selicon Carbide. Air Force Cambridge Research Laboratories, Bedford, Mass., Sept. 1966, 23 p. Order No. AD–645 649. $3.

Investigation of Two-Carrier Injection Electroluminescence. RCA, for the Air Force, Dec. 1966, 47 p. Order No. AD–647 087. $3.

Physical Research on Fundamental Properties of II-VI Compound Semiconductors. Brown University, for the Air Force, Nov. 1966, 75 p. Order No. AD–649 242. $3.

Relation of Mechanical Properties to the Structure of Ionic Solids, Pennsylvania State University, for the Army, Sept. 1966, 41 p. Order No. AD–641 911. $3.

Effects of Radiation on Semiconductor Materials and Devices. Bell Telephone Laboratories, New York, N.Y., for the Air Force, Dec. 1966, 256 p. Order No. AD–650 195 $3.

Deep-Ocean Biodeterioration of Materials—Part IV. One Year at 2,370 feet. Naval Civil Engineering Laboratory, Port Hueneme, Calif., May 1967, 65 p. Order No. AD–651 124. $3.

Evaluation of Vehicle Corrosion Preventives. Rock Island Arsenal, Ill., Dec. 1965, 37 p. Order No. AD–476 493. $3.

Thermophysical Properties of High Temperature Solid Materials. Purdue University, for the Air Force, Oct. 1966, 35 p. Order No. AD–648 235. $3.

Mercury Atmosphere and Surface. Redstone Scientific Information Center, Redstone Arsenal, Huntsville, Ala., Jan. 1967, 89 p. Order No. AD–650 033. $3.

Summary of AFCRL Rocket and Satellite Experiments (1946–1966). Air Force Cambridge Research Laboratories, Bedford, Mass., Dec. 1966, 65 p. Order No. AD–649 333. $3.

Bibliography of Lunar and Planetary Research—1965. Air Force Cambridge Research Laboratories, Bedford, Mass., Jan. 1967, 183 p. Order No. AD–648 463. $3.

Landau Waves. Stanford University, for the Aerospace Research Laboratories, Jan. 1967, 158 p. Order No. AD–651 461. $3.

A Generalized Graphic Presentation of Magneto-Hydrodynamic Accelerator and Generator Performance Characteristics. Arnold Engineering Development Center, Arnold AFS, Tenn., Oct. 1965, 45 p. Order No. AD–472 727. $3.

An Inventory of Geographic Research of the Humid Tropic Environment, Vol. 2—Compendium and Appendices. Texas Instruments, Inc., Dallas, Tex., for the Army, Dec. 1966, 500 p. Order No. AD–650 261. $3.

Remote Sensing of Environment. University of Michigan, for the Navy, April 1967, 28 p. Order No. AD–650 581. $3.

Large Aperture Seismic Array (LASA), First LASA Systems Evaluation Conference. Advanced Research Projects Agency, Washington, D.C., Feb. 1966, 300 p. Order No. AD–648 415. $3.

GOVERNMENT PRINTING OFFICE PUBLICATIONS

These publications may be purchased at the prices indicated from:

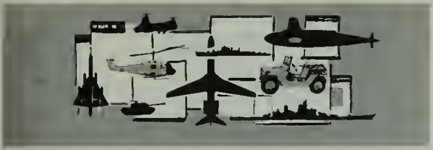
Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

MILSTRIP, Military Assistance Program Addresses, Supplement No. 2, Dec. 1, 1966. Contains complete listing of addresses used by the Services and Agencies to accomplish shipments of Foreign Military Sales and Grant Aid material. 1966. 331 p. Catalog No. D7.6/4:M59/supp. 2. $1.75.

Communications, Telecommunications Engineering Installation Practices. Provides instructions for engineering and installing line-of-sight radio communications systems in accordance with the requirements of the Defense Communications System and the Army Strategic Communications Command. 1966. 362 p. il. Catalog No. D101.11/2:105–50/Chap. 3. $3.75.

Command and Staff Action. Describes Marine Corps staff organization, responsibilities of staff officers, and the procedures of staff functioning followed by a presentation of principles, procedures, and techniques applicable to loading force planning during amphibious operations. 1966. 712 p. il. Catalog No. D214.9/4:3–1. $3.75.

DSA Field Establishment Directory. Reflects each DSA field activity by level designation, mailing address, message address, and telephone number. 1967. 45 p. D7.6/7:5025.2/2. 40¢.



DEFENSE PROCUREMENT

Contracts of $1,000,000 and over awarded during the month of August 1967:

DEFENSE SUPPLY AGENCY

3—**Apparel Corp. of America**, Knoxville, Tenn. $2,257,100. 451,420 coated nylon twill ponchos. Defense Personnel Support Center, Philadelphia, Pa.

—**Owens-Illinois, Inc.**, Toledo, Ohio. $1,092,-336. 2,752,830 fiberboard boxes for individual combat meals and inflight food packets. Defense Personnel Support Center, Philadelphia, Pa.

4—**Montgomery Pipe & Tube Co.**, Miami, Fla. $1,672,008. 1,150 barbed tape dispensers, 113,044 rolls of concertina barbed tape, 11,250 cases of barbed tape steel and carrying cases. Defense Construction Supply Center, Columbus, Ohio.

—**Henry Weingartner & Co.**, New York, N.Y. $1,337,822. 14,082,340 lbs. of corrugated, zinc-coated sheet steel. Defense Industrial Supply Center, Philadelphia, Pa.

—**United Fruit & Food Corp.**, Boston, Mass. $1,054,337. 173,394 lbs. of dehydrated shrimp. Defense Personnel Support Center, Philadelphia, Pa.

7—**Shell Oil Co.**, New York, N.Y. $3,658,-100. 2,700,000 barrels of number six fuel oil. Defense Fuel Supply Center, Alexandria, Va.

8—**Dale Fashions, Inc.**, Vineland, N.J. $1,-505,400. 60,000 polyester/wool men's tropical coats. Defense Personnel Support Center, Philadelphia, Pa.

9—**J. P. Stevens & Co.**, New York, N.Y. $4,-891,257. 3,060,000 yards of cotton oxford, wind-resistant cloth. Defense Personnel Center, Philadelphia, Pa.

10—Defense Fuel Supply Center, Alexandria, Va., has awarded the following contracts for aviation gasoline:

Mobil Oil Corp., New York, N.Y. $15,-780,257. 96,355,000 gallons of Grade 115/145 and 2,805,100 gallons of grade 80/87.

Humble Oil & Refining Co., Houston, Tex. $11,581,208. 80,506,000 gallons of grade 115/145.

Cities Service Oil Co., New York, N.Y. $6,268,794. 42,000,000 gallons of grade 115/145.

Phillips Petroleum Co., Bartlesville, Okla. $9,214,489. 54,903,000 of grade 115/145 and 15,000 gallons of grade 100/130.

Texaco, Inc., New York, N.Y. $7,160,160. 50,400,000 gallons of grade 115/145.

Shell Oil Co., New York, N.Y. $4,522,-441. 28,840,000 gallons of grade 115/145, 902,000 gallons of grade 80/87 and 560,-000 gallons of grade 100/130.

American Oil Co., Chicago, Ill. $1,588,-068. 10,818,000 gallons of grade 115/145, 25,000 gallons of grade 100/130 and 21,000 gallons of grade 80/87.

Continental Oil Co., Houston, Tex. $1,-056,333. 6,746,000 gallons of grade 115/145.

Tidewater Oil Co., New York, N.Y. $1,-614,964. 10,500,000 gallons of grade 115/145.

Union Oil Co., Los Angeles, Calif. $2-259,640. 12,600,000 gallons of grade 115/145 and 20,000 gallons of grade 80/87.

15—**United Aircraft**, East Hartford, Conn. $1,-678,714. 2,819 sets of annular ball bearings. Defense Industrial Supply Center, Philadelphia, Pa.

—**Oregon Freeze Dry Foods**, Albany, Ore. $6,107,771. 6,547,092 food packets for long range patrols. Defense Personnel Support Center, Philadelphia, Pa.

—**Freeze Dry Products**, Evansville, Ind. $2,-474,146. 2,182,364 food packets for long range patrols. Defense Personnel Support Center, Philadelphia, Pa.

—**United Fruit and Food Corp.**, Boston, Mass. $1,939,159. 364,010 pounds of fish squares, dehydrated cod or haddock. Defense Personnel Support Center, Philadelphia, Pa.

—**General Foods**, White Plains, N.Y. $1,301,-286. 238,120 pounds of fish squares, dehydrated cod or haddock. Defense Personnel Support Center, Philadelphia, Pa.

18—**Riegel Textile Corp.**, New York, N.Y. $2,-758,912. 3,328,000 yards of cotton oxford, wind-resistant cloth. Defense Personnel Support Center, Philadelphia, Pa.

—The Defense Fuel Supply Center, Alexandria, Va., has awarded the following contracts for JP-4 jet fuel:

Standard Oil Co. of Calif., San Francisco, Calif. $3,908,205. 32,340,000 gallons.

Suntide Refining Co., Tulsa, Okla. $3,-494,400. 33,600,000 gallons.

Coastal States Petrochemical Co., Houston, Tex. $2,506,304. 23,856,000 gallons.

Atlantic Richfield Co., Los Angeles, Calif. $1,013,040. 8,400,000 gallons.

23—**Bibb Mfg. Co.**, Macon, Ga. $1,123,006. 242,-550 yards of polymide twill, high temperature resistant cloth. Defense Personnel Support Center, Philadelphia, Pa.

—**Kaiser Steel Corp.**, El Monte, Calif. $27,-382,320. 126,000 bundles of steel landing mats. Defense Construction Supply Center, Columbus, Ohio.

—**Putnam Mills Corp.**, New York, N.Y. $1,-062,746. 721,000 yards of water resistant cloth. Defense Personnel Support Center, Philadelphia, Pa.

—**J. P. Stevens & Co.**, New York, N.Y. $1,-022,434. 700,000 yards of water resistant cloth. Defense Personnel Support Center, Philadelphia, Pa.

—**Plastoid Corp.**, Hamburg, N.J. $2,797,337. 53,282 one-mile reels of telephone cable. Defense Industrial Supply Center, Philadelphia, Pa.

25—**Riegel Textile Corp.**, New York, N.Y. $5,687,475. 2,080,000 yards of cotton sateen cloth (45-inch width) and 9,173,930 yards of cotton sateen cloth (42-inch width). Defense Personnel Support Center, Philadelphia, Pa.

—**Prestex, Inc.**. New York, N.Y. $2,087,908. 2,614,612 yards of cotton sateen cloth (38-inch width). 1,628,172 yards of cotton sateen cloth (42-inch width) and 99,144 yards of cotton sateen cloth (45-inch width). Defense Personnel Support Center, Philadelphia, Pa.

—**J. P. Stevens & Co.**, New York, N.Y. $1,-799,967. 3,575,000 yards of cotton sateen cloth (45-inch width). Defense Personnel Support Center. Philadelphia, Pa.

28—**Uniroyal**, Providence, R.I. $1,454,826. 386 ponton floats. Defense Construction Supply Center, Columbus, Ohio.

—**J. P. Stevens & Co.**, New York, N.Y. $1,-702,679. 718,000 linear yards of tropical wool and polyester cloth. Defense Personnel Support Center, Philadelphia, Pa.

—**South Jersey Clothing Co.**, Minotola, N.J. $1,464,870. 69,000 men's green wool serge coats with belts. Defense Personnel Support Center, Philadelphia, Pa.

—**Apparel Corp.**, Knoxville, Tenn. $1,425,-500. 232,545 men's field coats with hoods. Defense Personnel Support Center, Philadelphia, Pa.

30—**M-R-S Mfg. Co.**, Flora, Miss $1,927,960. Thirty wheeled construction tractors with scrapers. Defense Construction Supply Center, Columbus, Ohio.

31—**Riegel Textile Corp.**, New York, N.Y. $2,-657,280. 2,400,000 linear yards of camouflage printed cotton poplin cloth. Defense Personnel Support Center, Philadelphia. Pa.

—The Defense Fuel Supply Center, Alexandria, Va., has awarded the following contracts for petroleum products:

Refineria Panama S.A., New York, N.Y. $2,910,000. 1,500,000 gallons of number six fuel oil.

Gulf Oil Co., Houston, Tex. $2,618,061. 335,300 gallons of diesel fuel and 564,-700 gallons of number six fuel oil.

Howard Fuel Corp., Brooklyn, N.Y. $1,-866,444. 850,000 gallons of number six fuel oil and 3,000 gallons of diesel oil.

Mobile Oil Corp., New York, N.Y. $1,-649,877. 319,000 gallons of number six fuel oil, 244,770 gallons of diesel fuel and 80,000 gallons of gasoline.

CONTRACT LEGEND

Contract information is listed in the following sequence: Date—Company—Value—Material or Work to be Performed—Location of Work Performed (if other than company plant)—Contracting agency.

DEPARTMENT OF THE ARMY

1—**Cessna Aircraft Co.**, Wichita, Kan. $2,-350,000. SUU-7C/A bomb dispensers. Ammunition Procurement & Supply Agency, Joliet, Ill.

2—**American Bosch Arma Corp.**, Springfield, Mass. $1,241,421. Fuel metering pumps for 2½-ton trucks. Tank Automotive Command, Warren, Mich.

—**Bell Aerospace Corp.**, Fort Worth, Tex. $1,633,396. Tail rotor hub assemblies for UH-1 helicopters. Aviation Materiel Command, St. Louis, Mo.

3—**Martin-Marietta**, Orlando, Fla. $5,000,-000. Improved Pershing ground support equipment. Army Missile Command, Huntsville, Ala.

—**Lear-Siegler**, Maple Heights, Ohio. $2-903,162. M60, M48 and M103 tank generator assemblies. Tank Automotive Command, Warren, Mich.

—**Polan Industries**, Huntington, W. Va. $2,-256,000. Truck mounted mine detecting sets. Mobility Equipment Command, St. Louis, Mo.

—**Bell Aerospace Corp.**, Fort Worth, Tex. $1,000,000. Crash damage repair kits for UH-1 helicopters. Aviation Materiel Command, St. Louis, Mo.

4—**U.S. Steel Corp.**, Pittsburgh, Pa. $6,308,-100. Metal parts for 8-inch howitzer projectiles. Berwick, Pa. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Continental Motors**, Muskegon, Mich. $3,-855,650. Multi-fuel engines for 2½-ton trucks. Tank Automotive Command, Warren, Mich.

—**Penner Construction Co.**, Denver, Colo. $1,255,270. Construction of a Federal Regional Center Complex at Denver. Engineer Dist., Omaha, Neb.

—**Spencer Construction Co.**, Carrollton, Tex. $1,181,567. Construction of a floodway extension on the Trinity River. Fort Worth, Tex. Engineer Dist., Fort Worth. Tex.

—**D. E. Goodchild, Inc.**, Circleville, Ohio. $1,-032,159. Construction of asphalt roads and a 138-foot bridge in connection with the Deer Creek, Ohio, Reservoir Project. Engineer Dist., Huntington, W. Va.

—**U.S. Steel Corp.**, Pittsburgh, Pa. $1,000,-000. Reactivation, repair and relocation of Government equipment. Berwick, Pa. Ammunition Procurement & Supply Agency, Joliet, Ill.

7—**Philco-Ford Corp.**, Newport Beach, Calif. $1,786,647. Signal convertors for the Shillelagh missile system. Lawndale, Calif. Southwest Procurement Detachment, Pasadena, Calif.

—**Strick Corp.**, Fairless Hills, Pa. $3,074,-103. Twelve-ton semi-trailers. Chicago, Ill. Tank Automotive Command, Warren, Mich.

—**Independent Lock Co.**, Fitchburg, Mass. $2,637,765. Metal parts for ammunition fuzes. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Rulon Co.**, Aurora, Ill. $4,376,058. Metal parts for fuzes. Chicago, Ill. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Lear-Siegler, Inc.**, Anaheim, Calif. $4,861,034. Metal parts for fuzes. Ammunition Procurement & Supply Agency, Joliet, Ill.

9—**FMC Corp.**, Santa Clara, Calif. $1,875,000. Metal parts for 4.2-inch high explosive projectiles. Northwest Procurement Agency, Oakland, Calif.

—**L.S.I. Service Corp.**, Oklahoma City, Okla. $4,724,379. Personnel services for maintenance of Army aircraft in Vietnam. Aviation Material Command, St. Louis, Mo.

—**Dyna Electron Corp.**, Fort Worth, Tex. $8,312,105. Services of contractor personnel for maintenance of Army aircraft in Vietnam. Aviation Material Command, St. Louis, Mo.

—**Chrysler Corp.**, New Orleans, La. $4,000,000. 175mm projectiles. St. Louis, Mo. Ammuniion Procurement & Supply Agency, Joliet, Ill.

—**Ronlee, Inc.**, Miami Springs, Fla. $2,548,040. Construction work on the Central and Southern Florida Flood Control Project. Engineer Dist., Jacksonville, Fla.

—**Peter Kiewit Sons Co.**, Seattle, Wash. $3,547,400. Construction of a multi-purpose recreation building; an airmen dormitory; a warehouse; an automotive shop; and modifications to existing airmen dormitories. Clear Air Force Station, Alaska. Engineer Dist., Anchorage, Alaska.

—**Firestone Tire & Rubber Co.**, Akron, Ohio. $7,849,565. Track shoe assemblies for M113 armored personnel carriers. Noblesville, Ind. Tank Automotive Command, Warren, Mich.

—**J. A. Jones Construction Co.**, Charlotte, N.C. $2,000,000. Construction of processing facilities at the Army Ammunition Plant, Radford, Va. Engineer Dist., Norfolk, Va.

—**Chrysler Corp.**, New Orleans, La. $15,000,000. 175mm projectiles. St. Louis, Mo. Ammunition Procurement & Supply Agency, Joliet, Ill.

10—**General Motors**, Kokomo, Ind. $1,103,715. Squad radio sets. Electronics Command, Philadelphia, Pa.

—**Chaney & Hope, Inc.**, Addison, Tex. $1,626,500. Construction of training ranges for basic and advanced infantry training. Fort Dix, N.J. Engineer Dist., New York, N.Y.

—**Cook Construction Co.**, Jackson, Miss. $9,834,632. Construction work on the Melvern Dam & Reservoir Project. Melvern, Kan. Engineer Dist., Kansas City, Mo.

11—**Al Johnson Construction Co., Massman Construction Co. and Peter Kiewit Sons' Co.**, Minneapolis, Minn. $20,926,671. Construction work on the Racine Lock and Dam Project. Meigs County, Ohio, and Mason County, W. Va. Engineer Dist., Huntington, W. Va.

—**Remington Arms Co.**, Bridgeport, Conn. $16,249,267. 7.62mm and 5.56mm cartridges. Independence, Mo. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Federal Cartridge Corp.**, Minneapolis, Minn. $43,801,904. 5.56mm and 7.62mm cartridges and for operation and maintenance activities at the Twin Cities Army Ammunition Plant, New Brighton, Minn. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Fairbanks Morse, Inc.**, Beloit, Wis. $5,984,544. Manufacture and delivery of 10 vertical flood water pumps for the St. Francis Basin, Mississippi River and tributaries flood control project. Engineer Dist., Memphis, Tenn.

—**General Electric**, Syracuse, N.Y. $1,904,034. Improvement kits for the Hercules missile system. Army Missile Command, Huntsville, Ala.

—**Standard Container Co.**, Montclair, N.J. $1,865,500. Ammunition box assemblies. Homerville, Ga. Frankford Arsenal, Philadelphia, Pa.

—**King Fisher Marine Service**, Port Lavaca, Tex. $1,146,400. Construction work on lock and dam number two, Arkansas River Project. Grady, Ark. Engineer Dist., Little Rock, Ark.

—**Midvale-Heppenstall Co.**, Philadelphia, Pa. $1,153,425. Forgings for 175mm guns. Watervliet Arsenal, Watervliet, N.Y.

—**Colt's, Inc.**, Hartford, Conn. $2,087,670. Barrel assemblies for M16 and M16Al. Army Weapons Command, Rock Island, Ill.

—**Chamberlain Mfg. Corp.**, Waterloo, Iowa, $1,183,259. Metal parts for 4.2-inch illuminating projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Lake McDonald, Inc.**, Vidalia, Ga. $2,841,000. Construction of 180 housing units at Fort Jackson, S.C. Engineer Dist., Savannah, Ga.

14—**Martin-Marietta Corp.**, Orlando, Fla. $2,294,883. Metal parts for aerial mines. Ammunition Procuremnt & Supply Agency, Joliet, Ill.

—**Sprague Electric Co.**, North Adams, Mass. $1,312,500. Integrated circuits for M514Al fuzes. Worcester, Mass. Harry Diamond Laboratories, Washington, D.C.

—**Wesinghouse Electric**, Elk Ridge, Md. $1,282,500. Integrated circuits for M514A1 fuzes. Harry Diamond Laboratories, Washington, D.C.

15—**Franchi Construction Co.**, Newton, Mass. $6,710,000. Construction of troop housing and supporting facilities at Fort Devens, Mass. New England Division, Army Corps of Engineers, Waltham, Mass.

—**American Dredging Co.**, Philadelphia, Pa. $5,388,000. Dredging about 19 miles of channel on the Arkansas River. Near Dardanelle, Ark. Engineer Dist., Little Rock, Ark.

—**Eureka Williams Co.**, Bloomington, Ill. $4,044,944. Metal parts for 750-lb. bomb nose fuzes. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Pace Corp.**, Memphis, Tenn. $1,968,062. M49Al surface trip flares. Memphis, Tenn.; Camden, Ark.; and Russell, Ark. Picatinny Arsenal, Dover, N.J.

—**Continental Motors**, Muskegon, Mich. $1,594,908. Multi-fuel engines for five ton trucks. Tank Automotive Command, Warren, Mich.

16—**R.C.A.**, Camden, N.J. $5,992,686. Radio sets and receiver/transmitters. Electronics Command, Philadelphia, Pa.

—**Raytheon Co.**, Lexington, Mass. $4,890,536. Hawk guidance and control component sets. Andover, Mass. Army Missile Command, Huntsville, Ala.

—**Emerson Electric Co.**, St. Louis, Mo. $4,382,620. Line items of repair parts for the XM28 aircraft armament subsystem. Army Weapons Command, Rock Island, Ill.

—**General Instrument, Inc.**, Chicopee, Mass. $2,253,600. Metal parts assemblies for 750-lb. bomb nose fuzes. Ammunition Procurement & Supply Agency, Joliet, Ill.

17—**Magnavox Co.**, Fort Wayne, Ind. $9,366,688. AN/GRC-106 radio sets. Electronics Command, Philadelphia, Pa.

—**I.T. & T.**, Nutley, N.J. $2,421,141. Installation, services and materials for interconnection, testing and alignment of Government-owned ET-A Phase II communication equipment. West Germany. Electronics Command, Fort Monmouth, N.J.

—**Amron Corp.**, Waukesha, Wis. $1,290,000. M103, 20mm brass cartridge cases. Frankford Arsenal, Philadelphia, Pa.

18—**Memcor, Inc.**, Huntington, Ind. $14,115,389. Receiver-transmitter portions of the AN/VRC-12 family of vehicle radio communications sets. Electronics Command, Philadelphia, Pa.

—**R. G. LeTourneau, Inc.**, Longview, Tex. $18,595,500. Metal parts for M117Al, 750-lb. bombs. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Raytheon Co.**, Lexington, Mass. $3,712,800. M905 fuzes for 750-lb. bombs. Bristol, Tenn. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Talley Industries**, Mesa, Ariz. $2,333,080. Loading assembly for 4.2-inch projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Stewart-Warner Corp.**, Lebanon, Ind. $2,062,830. M49A2 60mm mortar projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Airport Machine Co.**, Martin, Tenn. $1,156,250. M49A2, 60mm mortar projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

21—**Sylvania Electric Products**, Mountain View, Calif. $1,000,000. Classified electronic equipment. Electronics Command, Fort Monmouth, N.J.

—**General Motors**, Detroit, Mich. $4,387,500. 81mm mortar projectiles. Warren, Mich. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**E. W. Blair, Inc.**, Salina, Kan. $1,233,423. Construction work on the Pine Creek Reservoir Project in Oklahoma. Engineer Dist., Tulsa, Okla.

—**Allis Chalmers Mfg. Co.**, Milwaukee, Wis. $5,975,555. Scoop loaders. Deerfield, Ill. Mobility Equipment Command, St. Louis, Mo.

—**Chamberlain Mfg. Corp.**, Waterloo, Iowa. $1,353,260. Metal parts for 4.2-inch illuminating projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Portable Electric Tools, Inc.**, Geneva, Ill. $1,016,015. Fin assemblies for 81mm illuminating projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Chrysler Corp.**, Centerline, Mich. $49,152,044. M60Al tanks, trainers, and M728 combat engineer vehicles with concurrent repair parts. Warren, Mich. Tank Automotive Command, Warren, Mich.

—**United Aircraft**, West Palm Beach, Fla. $3,750,000. Design, fabrication and test of an advanced technology, 1,500 horsepower, aircraft gas turbine demonstrator engine. Aviation Material Laboratories, Fort Eustis, Va.

22—**Alcan Aluminum Corp.**, Riverside, Calif. $1,480,500. Rocket motors for light anti-tank weapons. Southwest Procurement Agency, Pasadena, Calif.

—**Raytheon Co.**, Andover, Mass. $1,102,500. Refurbishment of Hawk missile launchers. Army Missile Command, Huntsville, Ala.

—**Anthony Co.**, Streator, Ill. $5,577,988. Rough terrain fork lift trucks. Army Mobility Equipment Command, St. Louis, Mo.

23—**Teichert & Son, Inc.**, Sacramento, Calif. $1,234,401. Work on the Sacramento River Bank Flood Protection Project. Engineer Dist., Sacramento, Calif.

—**Raytheon Co.**, Andover, Mass. $7,492,928. Fifteen line items of ground support equipment for the Hawk missile system. Army Missile Command, Huntsville, Ala.

—**General Motors**, Indianapolis, Ind. $2,823,294. Transmission assemblies for M48 and M60 tanks. Tank-Automotive Command, Warren, Mich.

24—**Caterpillar Tractor Co.**, Peoria, Ill. $2,867,517. Full-tracked tractors. Mobility Equipment Command, St. Louis, Mo.

—**Raytheon Co.**, Andover, Mass. $1,213,495. Rebuilding of sets of guidance and control components for Hawk missile systems. Army Missile Command, Huntsville, Ala.

—**Boeing Co.**, Morton, Pa. $1,734,650. Modification kits for CH-47 helicopters. Aviation Materiel Command, St. Louis, Mo.

—**Raytheon Co.**, Bedford, Mass. $1,270,463. Facilities for the manufacture of anti-intrusion warning mines. $3,648,057. Classified amount of anti-intrustion warning mines. Quincy, Mass. Picatinny Arsenal, Dover, N.J.

—**Sylvania Electronics Systems**, Williamsville, N.Y. $4,862,563. Classified amount of anti-intrusion warning mines. Buffalo, N.Y. Pictinny Arsenal, Dover, N.J.

—**American Cystoscope Makers.** Pelham Manor, N.Y. $2,141,532. Telescopes with mounts and spare parts. Bronx, N.Y. Frankford Arsenal, Philadelphia, Pa.

—**Mack Corp.**, Allentown, Pa. $1,748,560. Eleven line items for the ten-ton truck. Tank Automotive Command, Warren, Mich.

25—**Sperry Rand Corp.**, New York, N.Y. $37,068,642. Manufacturing, assembling, loading and packing of large caliber projectiles. Shreveport, La. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**General Motors**, Detroit, Mich. $3,150,620. Diesel engines for M113 vehicles. Tank Automotive Command, Warren, Mich.

—**Timmons, Butt & Head, Inc.**, Dayton, Ohio. $2,837,775. Construction of additions and alterations to a composite medical facility at Wright-Patterson AFB, Ohio. Engineer Dist., Louisville, Ky.

28—**Olin Mathieson Chemical Corp.**, East Alton, Ill. 24,452,226. Oil and artillery ammunition propellant. Baraboo, Wis. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Atlas Chemical Industries**, Wilmington, Del. $20,275,390. Manufacture of TNT. Chattanooga, Tenn. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Raytheon Co.**, Lexington, Mass. $1,968,800. Metal part for 750-lb. bomb nose fuzes. Bristol, Tenn. Ammuniton Procurement & Supply Agency, Joliet, Ill.

—**Farmers Chemical Association**, Tyner, Tenn. $2,415,186. Manufacture of TNT. Chattanooga, Tenn. Ammuntion Procurement & Supply Agency, Joliet, Ill.

—**Union Carbide Corp.**, New York, N.Y. $3,269,117. BA-386/PRC-25 dry batteries for AN/PRC-25 radio sets. Greenville and Charlotte, N.C. $3,194,382. BA-279/U dry batteries for AN/PRC 8, 9 and 10 radio sets. Charlotte, N.C. Electronics Command, Philadelphia, Pa.

—**Servell, Inc.**, Freeport, Ill. $1,198,500, BA-279/U dry batteries for AN/PRC-8, 9 and 10 radio sets. Electronics Command, Philadelphia, Pa.

—**Bucyrus Erie Co.**, Evansville, Ind. $4,-773,600. Cranes. Erie, Pa. Mobility Equipment Command, St. Louis, Mo.

29—**Kennedy Van Saun**, Danville, Pa. $1,165,-650. 60mm projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Kaiser Aluminum & Chemical Sales**, Erie, Pa. $1,269,625. Fin assemblies for 81mm mortars. Ammunition Procurement & Supply Agency, Joliet, Ill.

31—**Union Carbide Corp.**, Bennington, Vt. $1,986,000. M514 artillery fuze component. Harry Diamond Laboratories, Washington, D.C.

—**Page Aircraft Maintenance, Inc.**, Fort Rucker, Ala. $17,100,000. Maintenance of aircraft for a nine month period. Aviation Center, Fort Ruker, Ala.

—**Mason & Hanger, Silas Mason Co.**, Lexington, Ky. $22,235,724. Loading, assembling and packing ordnance items. Grand Island, Neb. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Norris Industries**, Los Angeles, Calif. $5,694,770. 105mm cartridge cases. Riverbank, Calif. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Temco. Inc.**, Nashville, Tenn. $1,411,410. Metal part for 106mm projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Plymouth Plastics Division of AMETEK, Inc.**, Sheboygen, Wis. $1,656,000. Support assemblies for fiber ammunition containers. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Fusion Rubbermaid Corp.**, Statesville, N.C. $1,835,044. Plastic canisters for tactical fighter dispensing munitions program. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Baldwin Electronics**, Little Rock, Ark. $2,-074,247. Fuze and switch assemblies for the tactical fighter dispensing system. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Atlantic Research Corp.**, West Hanover, Mass. $1,137,902. Explosives. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Batesville Mfg. Co.**, Batesville, Ark. $1,-278,328. 750-lb. bomb nose fuzes. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Olin Mathieson Chemical Corp.**, New York, N.Y. $3,592,644. Miscelleneous propellants. Charlestown, Ind. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Olin Mathieson Chemical Corp.**, East Alton, Ill. $8,940,458. 81mm illuminating projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Bell & Howell Co.**, Chicago, Ill. $5,614,-565. Metal parts for time fuzes. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Unidynamics**, Phoenix, Ariz. $3,274,944. 81mm illuminating projectiles. Goodyear, Ariz. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Chamberlain Mfg. Corp.**, Waterloo, Iowa. $2,677,375. 105mm projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**Amron Corp.**, Waukesha, Wis. $3,124,518. Classified components for 155mm projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**AVCO Corp.**, Richmond, Ind. $2,688,716. Classified components for 155mm projectiles. Ammunition Procurement & Supply Agency, Joliet, Ill.

—**General Motors**, Indianapolis, Ind. $3,605,-250. Transmissions for M60 tanks. Tank Automotive Command, Warren, Mich.

—**Continental Motors**, Muskegon, Mich. $5,-909,162. Engine assemblies for M60 tanks. $1,203,727. Various line items for rebuilding 5-ton truck engines. Tank Automotive Command, Warren, Mich.

—**Chrysler Corp.**, Warren, Mich. $1,119,759. M601 trucks. Tank Automotive Command, Warren, Mich.

—**FMC Corp.**, Charleston, W. Va. $23,188,-000. Armored personnel carriers and cargo carriers. Tank Automotive Command, Warren, Mich.

—**Texas Instrument, Inc.**, Dallas, Tex. $35,-000,000. Classified electronics equipment. Electronics Command, Fort Monmouth, N.J.

—**ITT Corp.**, Nutley, N.J. $1,388,876. Repair parts for communication systems equipment. Electronics Command, Fort Monmouth, N.J.

—**Stelma, Inc.**, Stamford, Conn. $1,110,984. Terminal telephones. Electronics Command, Philadelphia, Pa.

—**Roberts Corp.**, Albuquerque, N.M. $1,-545,428. Construction of a maintenance hanger, a pump house with utilities, pavements and a storage tank at Holloman AFB, N.M. Engineer Dist., Albuquerque, N.M.

—**Northrop Corp.**, Anaheim, Calif. $3,376,-540. Hawk launchers. Army Missile Command, Huntsville, Ala.

—**Raytheon Co.**, Bedford, Mass. $5,000,000. Advance development of SAM-D missiles. Army Missile Command, Huntsville, Ala.

DEPARTMENT OF THE NAVY

1—**Magnavox Co.**, Fort Wayne, Ind. $1,396,-106. A command active sonobuoy system for use with the A-NEW system. Naval Air Development Center, Johnsville, Pa.

—**Honeywell, Inc.**, St. Petersburg, Fla. $1,-528,205. Repair of Polaris MK 11 Mod O 16 Pendulous Integrating Gyro Accelerometers. Special Project Office.

2—**Sanders Associates**, Nashua, N.H. $1,995,-000. A passive analyzer system for project A-NEW. Naval Air Development Center, Johnsville, Pa.

—**Brewer Drydock Co.**, Staten Island, N.Y. $1,224,000. Activation of the destroyer escort USS Booth (DE–170). Supervisor of Shipbuilding, Fourth Naval Dist., Philadelphia, Pa.

—**Litton Systems**, Woodland Mills, Calif. $1,150,787. Circuit assemblies, amplifiers and logic assemblies for A6A aircraft special support equipment. Navy Aviation Supply Office, Philadelphia, Pa.

3—**General Dynamics**, Pomona, Calif. $12,-644,376. Standard Army missiles. Naval Air Systems Command.

—**Vitro Corp. of America**, Silver Spring, Md. $11,674,916. Fleet Ballistic Missile Program Weapon System engineering. Special Projects Office.

—**Reed & Martin, Inc.**, Honolulu, Hawaii. $11,263,209. Construction of 300 Navy family housing units at Camp Catlin, Oahu, Hawaii, and 250 Air Force family housing units at Wheeler AFB, Hawaii. Pacific Div., Naval Facilities Engineering Command, Pearl Harbor, Hawaii.

—**Grumman Aircraft Engineering Corp.**, Bethpage, N.Y. $6,500,000. Research and development on EA–6B aircraft. Naval Air Systems Command.

4—**Northrop Corp.**, Newbury Park, Calif. $4,-000,000. Design, development, fabrication, test and furnishing of an overall mobile ASW target system. Naval Ordnance Systems Command.

—**LTV Aerospace Corp.**, Dallas, Tex. $5,-500,000. A–7D aircraft. Naval Air Systems Command.

—**Tracer, Inc.**, Austin, Tex. $3,352,700. Technical services and engineering assistance on submarine sonar equipment. Naval Ship Systems Command.

—**Gilbane Building Co.**, Providence, R.I. $2,283,930. Construction of a technical training building at the Officers Candidate School, Newport, R.I. Northeast Div., Naval Facilities Engineering Command, Boston, Mass.

—**Allen M. Campbell Co.**, Tyler, Tex. $1,-522,000. Construction of an aircraft maintenance hanger at the Marine Corps Air Facility, New River, N.C. Atlantic Div., Naval Facilities Engineering Command, Norfolk, Va.

—**Litton Systems**, Woodland Hills, Calif. $1,220,224. Logic card relay modules for special support equipment for A6A aircraft. Navy Aviation Supply Office, Philadelphia, Pa.

—**Teledyne Systems Co.**, Hawthorne, Calif. $1,000,000. Self contained navigation systems. Naval Air Systems Command.

7—**North American Aviation**, Anaheim, Calif. $4,306,361. Repair and modification of Ships Inertial Navigation System (SINS) modules. $3,420,392. Repair and modification of SINS gyroscopes and velocity meters. Naval Ship Systems Command.

—**American Mfg. Co. of Tex.**, Fort Worth, Tex. $1,131,000. Acquisition and installation of facility items and handling equipment. Naval Air Systems Command.

—**Monsanto Research Corp.**, St. Louis, Mo. $1,000,000. Research on high performance composite materials. Office of Naval Research, Washington, D.C.

8—**Philco-Ford Corp.**, Philadelphia, Pa. $2,-294,226. Engineering, furnishing and installing microwave systems at Londonderry, Ireland; San Francisco, Calif.; and Hawaii. Naval Electronics Systems Command.

—**United Aircraft**, East Hartford, Conn. $1,662,793. Repair parts for J–52P8A engines used on A–4F and A–6A aircraft. Navy Aviation Supply Office, Philadelphia, Pa.

—**Curtiss Wright Corp.**, Wood-Ridge, N.J. $1,676,340. Parts to support power plant modifications on J65 engines used on A–4A/B and C aircraft. Navy Aviation Supply Office, Philadelphia, Pa.

9—**Teledyne Systems Co.**, Hawthorne, Calif. $7,406,350. Self-contained navigation systems. Naval Air Systems Command.

—**General Dynamics**, Pomona, Calif. $1,-308,095. Standard Arm missile checkout equipment. $5,003,000. Research and development on the Standarad Arm missile. Naval Air Systems Command.

—**Boeing Co.**, Morton, Pa. $3,110,702. CH–46 helicopters. Naval Air Systems Command.

—**Motorola, Inc.**, Scottsdale, Ariz. $2,119,-761. Guidance and control groups for Sidewinder 1C guided missiles. Naval Air Systems Command.

—**Alsco, Inc.**, St. Louis, Mo. $1,008,575. Rocket launcher components. Naval Air Systems Command.

—**Royal Industries**, Santa Ana, Calif. $1,-907,351. 600-gallon, external fuel tanks. Alhambra, Calif. Naval Air Systems Command.

10—**General Electric**, Schenectady, N.Y. $23,-072,690. Nuclear propulsion research and development. Naval Ship Systems Command.

—**Lockheed Aircraft**, Sunnyvale, Calif. $4,-102,000. Repair and logistic services for Polaris missiles. Special Projects Office.

—**Sangamo Electric Co.**, Springfield, Ill. $1,429,900. Sonar sets for use on naval ships. Naval Ship Systems Command.

11—**Genge Industries, Inc.**, Oxnard, Calif. $1,-720,686. Facilities, materials and services required in the preparation of data used in the overhaul, alteration and repair of ships at Pearl Harbor Naval Shipyard. Naval Supply Center, Pearl Harbor, Hawaii.

14—**Hazeltine Corp.**, Little Neck, N.Y. $6,-186,950. Airborne interrogator sets and related support equipment. Naval Air Systems Command.

—**General Instrument Corp.**, Chicopee, Mass. $5,680,000. Snakeye M990 bomb fuzes. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**F. D. Rich Co.**, Stamford, Conn. $3,224,-000. Construction of 200 housing units at the Quonset Point, R.I., Naval Air Station. Northeast Div., Naval Facilities Engineering Command, Boston, Mass.

—**General Dynamics**, Pomona, Calif. $1,-000,000. FY 1968 installment funding for research and development of the Standard Missile Type I. Naval Ordnance Systems Command.

15—**Boeing Co.**, Morton, Pa. $3,076,000. CH–46 helicopters. Naval Air Systems Command.

—**Westinghouse Electric**, Baltimore, Md. $1,451,689. Development effort related to the Fleet Ballistic Missile weapon system. Special Project Office.

16—**Cameron Iron Works**, Houston, Tex. $1,-783,130. Mark 30, Mod 2 rocket motors and Mark 2, Mod 1 guided missile boosters for the Terrier missile. Naval Ordnance Station, Indian Head, Md.

—**Harnischfeger Corp.**, Milwaukee, Wis. $1,000,000. Truck mounted cranes. Escanaba, Mich. Hqtrs, Marine Corps.

17—**May Aluminum, Inc.**, El Campo, Tex. $3,-698,051. Aluminum air field pallets and mat assemblies for use in landing aircraft. Naval Air Engineering Center, Philadelphia, Pa.

18—**Grumman Aircraft Engineering Corp.**, Bethpage, N.Y. $2,150,000. Classified work on Navy aircraft. Naval Air Systems Command.

21—**U.S. Steel Corp.**, Pittsburgh, Pa. $33,867, 918. Mark 82 bomb bodies. McKeesport, Pa. Navy Ships Parts Control Center, Mechanicsbug, Pa.

—**American Machine & Foundry Co.**, York, Pa. $11,214,000. Mark 82 bomb bodies. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Intercontinental Mfg. Co.**, Garland, Tex. $7,392,000. Mark 82 bomb bodies. Navy Ships Parts Control Center, Mechanicsburg, Pa.

—**Allen M. Campbell Co.**, Tyler, Tex. $6,602,654. Construction of a helicopter group training facility at the Marine Corps Air Facility, Jacksonville, N.C. Naval Facilities Engineering Command.

—**Sparton Corp.**, Jackson, Mich. $2,992,489. Sonobuoys. Naval Air Systems Command.

22—**General Dynamics**, Pomona, Calif. $12,715,000. Research and development work on the Standard ARM missile. Naval Air Systems Command.

23—**United Aircraft**, Stratford, Conn. $17,800,000. Production of CH–53A helicopters. Naval Air Systems Command.

—**Magnavox Co.**, Fort Wayne, Ind. $5,349,136. FY 1968 procurement of sonobuoys. Naval Air Systems Command.

—**Motorola**, Chicago, Ill. $1,680,167. FY 1968 procurement of bathythermograph transmitter sets. Naval Air Systems Command.

24—**Allen M. Campbell Co.**, Tyler, Tex. $2,620,000. Construction of a composite medical facility at the Naval Air Station, Albany, Ga. Naval Facilities Engineering Command.

—**Willamette Iron & Steel Co.**, Richmond, Calif. $1,122,252. Drydocking and repair of the attack cargo ship USS Merrick AKA–97). Supervisor of Shipbuilding, Twelfth Naval Dist., San Francisco, Calif.

25—**Garrett Corp.**, Phoenix, Ariz. $2,700,000. Services and materials necessary to perform a product improvement program on YT76–6/8 and T76–G–10/12 engines for OV–10A aircraft. Naval Air Systems Command.

28—**Sperry Rand Corp.**, Syosset, N.Y. $3,350,000. Inertial navigation subsystem components for Fleet Ballistic Missile submarines. Naval Ship Systems Command.

—**United Aircraft**, East Hartford, Conn. $2,593,147. A–4E and A–6A aircraft engine modification kits. Aviation Supply Office, Philadelphia, Pa.

—**Yuba Industries**, Benicia, Calif. $2,385,112. Catapult track cover assemblies for aircraft carriers. Naval Supply Center, Oakland, Calif.

—**Lansdowne Steel & Iron Co.**, Morton, Pa. $1,413,871. Mark 52 projectiles. Navy Ships Parts Control Center, Mechanicsburg, Pa.

29—**Grumman Aircraft Engineering Corp.**, Bethpage, N.Y. $3,000,000. Initial design for an improved search radar, a new digital computer system, and a weapons release system in the A–6A aircraft. Naval Air Systems Command.

—**United Aircraft**, East Hartford, Conn. $1,613,913. Engine spare parts used to support the TF30P6 engine on A–7A aircraft. Aviation Supply Office, Philadelphia, Pa.

30—**North American Aviation**, Columbus, Ohio. $50,000,000. FY 1968 incremental funding of Phase II engineering development of Condor missiles. Naval Air Systems Command.

—**F. D. Rich Co.**, Stamford, Conn. $3,379,000. Construction of 212 housing units at Naval Air Station, Key West, Fla. Southeast Div., Naval Facilities Engineering Command, Charleston, S.C.

—**Westinghouse Electric**, Baltimore, Md. $2,011,049. Support items and programs for APG–59/60/61 radar sets. Naval Air Systems Command.

—**United Aircraft**, Stratford, Conn. $1,200,000. Long lead time effort for HH–3E helicopters for the Air Force. Naval Air Systems Command.

31—**McDonnell-Douglas Corp.**, St. Louis, Mo. $38,749,679. F–4 aircraft. Naval Air Systems Command.

—**Goodyear Aerospace Corp.**, Akron, Ohio. $4,601,250. Production of SUBROC missiles and related equipment. Naval Ordnance Systems Command.

—**Hawaiian Dredging & Construction Co.**, Honolulu, Hawaii. $1,784,300. Reconstruction of Berth B–3 at the Naval Shipyard, Pearl Harbor. Naval Facilities Engineering Command.

—**United Aircraft Corp.** $1,707,775. Spare parts to support the TF30–P–12 engine for F111B aircraft. Naval Supply Systems Command.

DEPARTMENT OF THE AIR FORCE

1—**Serv-Air Inc.**, Enid, Okla. $8,095,287. Base support services for FY 1968 at Vance AFB, Okla. San Antonio Air Materiel Area, (AFLC), Kelly AFB, Tex.

—**Westinghouse Electric**, Baltimore, Md. $2,567,550. Production of airborne communications equipment. Electronic Systems Div., (AFSC), L. G. Hanscom Field, Mass.

—**Bendix Corp.**, Teterboro, N.J. $3,636,600. Modification of airborne computers. Wilkes-Barre, Pa. Oklahoma City Air Materiel Area, (AFLC), Tinker AFB, Okla.

3—**Northrop Corp.**, Hawthorne, Calif. $2,715,160. Manufacture and assembly of F–5A and F–5B aircraft and related supplies. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**Bendix Corp.**, Teterboro, N.J. $2,364,398. Manufacture of components for airborne navigational equipment. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

4—**Hughes Aircraft**, Culver City, Calif. $6,557,518. Conversion of AIM 4–C aircraft missiles to AIM 4–D. Tucson, Ariz. Warner Robins Air Materiel Area, (AFLC), Robbins AFB, Ga.

—**Goodyear Aerospace Corp.**, Akron, Ohio. $5,244,000. Cargo handling pallets. Warner Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

—**Hayes International Corp.**, Birmingham, Ala. $4,537,974. Training sets for the Minuteman missile system. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

—**Serv-Air, Inc.**, Enid, Okla. $2,789,699. Services in support of the pilot training program at Sheppard AFB, Tex. San Antonio Air Materiel Area, (AFLC), Kelly AFB, Tex.

—**North American Aviation**, Anaheim, Calif. $2,200,000. Maintenance, repair, overhaul and modification of Minuteman guidance and control systems. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

—**Cornell Aeronautical Laboratory**, Buffalo, N.Y. $1,400,000. Development, design, and fabrication of a variable stability aircraft. Systems Engineering Group, Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

7—**Meanasco Mfg. Co.**, Burbank, Calif. $1,735,586. Manufacture of landing gear components for C–130 aircraft. Ogden Air Materiel Area, (AFLC), Hill AFB, Utah.

8—**Greenhut Construction Co.**, Pensacola, Fla. $4,840,821. Construction of 300 family housing units at Eglin AFB, Fla. Air Proving Ground Center, Eglin AFB, Fla.

—**Atlantic Research Corp.**, Alexandria, Va. $3,324,783. Manufacture of meteorological rockets and components. Gainesville, Va. Ogden Air Materiel Area, (AFLC), Hill AFB, Utah.

9—**Textron, Inc.**, Belmont, Calif. $1,440,495. Spare parts for airborne electronics equipment. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**Stelma, Inc.**, Stamford, Conn. $2,775,693. Portable communication components for tactical air control systems. Electronic Systems Div., (AFSC), L. G. Hanscom Field, Mass.

10—**General Electric**, Syracuse, N.Y. $1,000,000. Test operations and related tasks in support of various Air Force and NASA programs. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

—**Martin-Marietta**, Denver, Colo. $5,534,000. Design, development and fabrication of Titan IIIC space boosters and associated aerospace ground equipment. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

—**General Electric**, Evendale, Ohio. $2,500,000. Developmental work on a lift cruise engine. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

11—**Ralph M. Parsons Co.**, Los Angeles, Calif. $1,043,161. Engineering and support services for Minuteman site activation and alteration activities. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

—**Hughes Aircraft**, Canoga Park, Calif. $1,450,000. Work on an air/ground missile program. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**Applied Technology, Inc.**, Sunnyvale, Calif. $2,148,340. Production of airborne electronic equipment for A–7B aircraft for the Navy. Warner Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

—**North American Aviation**, Columbus, Ohio. $1,450,000. Work on an air/ground missile program. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**Stromberg-Carlson Corp.**, Rochester, N.Y. $1,204,758. Procurement of central telephone office equipment. Oklahoma City Air Materiel Area, (AFLC), Tinker AFB, Okla.

—**Marwais Steel Co.**, Richmond, Calif. $4,138,803. Procurement of aircraft revetments. 2750th Air Base Wing, Wright-Patterson AFB, Ohio.

14—**Wall Colmonoy Corp.**, San Antonio, Tex. $2,425,179. Repair of jet engine combustion chambers. San Antonio Air Materiel Area, (AFLC), Kelly AFB, Tex.

—**Continental Aviation & Engineering Corp.**, Detroit, Mich. $1,289,572. Production of J–69 engines for T–37 aircraft. Toledo, Ohio. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

15—**Electronic Communications, Inc.**, St. Petersburg, Fla. $1,699,326. Production of components for airborne electronic systems. Warner-Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

—**International Telephone & Telegraph Corp.**, Nutley, N.J. $1,522,850. Production of spare parts for airborne electronic systems. Warner-Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

—**Collins Radio Co.**, Dallas, Tex. $1,164,895. Manufacture of high frequency single side band consoles. Richardson, Tex. Oklahoma City Air Materiel Area, (AFLC), Tinker AFB, Okla.

16—**United Aircraft**, East Hartford, Conn. $2,500,000. Developmental work on a lift cruise engine. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**The Canadian Commercial Corp.** has been awarded three contracts under the U.S.-Defense Production/Development Sharing Program. Work will be performed under sub-contracts as follows:

United Aircraft of Canada, Ltd., Longueill, Quebec. $1,399,811. Spare parts for R–2000 aircraft engines. San Antonio Air Materiel Area, (AFLC), Kelly AFB, Tex.

United Aircraft of Canada, Ltd., Longueill, Quebec. $1,946,539. Spare parts for R–4360 aircraft engines. San Antonio Air Materiel Area, (AFLC), Kelly AFB, Tex.

Litton Systems (Canada), Ltd., Rexdale, Ontario. $1,134,774. Weapons release system AN/ASQ–91 for F–4 aircraft. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio. (Issued on Aug. 23).

17—**LTV Electrosystems, Inc.**, Greenville, Tex. $2,343,621. Inspection and repair of C–130 aircraft. Warner-Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

—**Hayes International Corp.**, Birmingham, Ala. $3,335,938. Inspection and repair of C–130 aircraft. Warner-Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

—**Fairchild-Hiller Corp.**, St. Augustine, Fla. $2,294,428. Inspection and repair of C–130 aircraft. St. Petersburg, Fla. Warner-Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

—**LTV Electrosystems, Inc.**, Greenville, Tex. $1,323,426. Inspection and repair of C–133 aircraft. Warner-Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

18—**Western Electric Co.**, New York, N.Y. $1,694,700. Missile borne guidance equipment. Burlington, N.C. Space & Missle Systems Organization, (AFSC), Los Angeles, Calif.

—**Bendix Corp.**, Teterboro, N.J. $1,453,783. Repair and modification of airborne computer components. Wilkes Barre, Pa. and

Teterboro. Oklahoma City Air Materiel Area, (AFLC), Tinker AFB, Okla.

—**Weber Aircraft Co.,** Burbank, Calif. $1063,788. Production of components to modify the F–105 crew escape system. Sacramento Air Materiel Area, (AFLC), McClellan AFB, Calif.

21—**Bendix Corp.,** Teterboro, N.J. $1,011,000. Manufacture of navigational computer sets for C–141 aircraft. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**Boeing Co.,** Wichita, Kan. $3,400,852. B–52 field modification services. Barksdale AFB, La.; Castle AFB, Calif.; and Westover AFB, Mass. Oklahoma City Air Materiel Area, (AFLC), Tinker AFB, Okla.

—**Sanders Associates, Inc.,** Nashua, N.H. $2,253,798. Production of airborne radio direction finding equipment. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**Lockheed Missiles & Space Co.,** Sunnyvale, Calif. $1,113,000. Maintenance and support testing of the AGENA program. Santa Cruz, Calif. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

22—**Stewart Warner Corp.,** Chicago, Ill. $1,256,427. Manufacture of components for airborne radar altimeters. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**North American Aviation,** Anaheim, Calif. $2,917,131. Development, fabrication and test of a laser subsystem. Air Proving Ground Center, Eglin AFB, Fla.

23—**Bendix Corp.,** Teterboro, N.J. $1,358,938. Manufacture of components for airborne navigational sets. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB, Ohio.

—**North American Aviation,** Tulsa, Okla. $4,152,671. Inspection and repair of air/ground missiles. Oklahoma City Air Materiel Area, (AFLC), Tinker AFB, Okla.

—**Fairchild Hiller Corp.,** Farmingdale, N.Y. $2,341,750. Manufacture of fuel modification kits for F–105 aircraft. Sacramento Air Materiel Area, (AFLC), McClellan AFB, Calif.

24—**Martin-Marietta,** Baltimore, Md. $1,115,934. Modification of KC–135 aircraft. Oklahoma City Air Materiel Area, (AFLC), Tinker AFB, Okla.

28—**Aero Corp.,** Lake City, Fla. $3,047,847. Inspection and repair of C–124 aircraft. Warner Robins Air Materiel Area, (AFLC), Robins AFB, Ga.

—**Curtiss-Wright Corp.,** Wood-Ridge, N.J. $1,039,400. Overhaul of J–57 aircraft engines. San Antonio Air Materiel Area, (AFLC), Kelly AFB, Tex.

29—**Aerodex, Inc.,** Miami, Fla. $3,086,951. Overhaul of J–57 aircraft engine components. San Antonio Air Materiel Area, (AFLC), Kelly AFB, Tex.

—**Sylvania Electric Products,** Needham Heights, Mass. $1,386,565. Fabrication of a launch control facility. Space & Missile Systems Organization, (AFSC), Los Angeles, Calif.

—**Aerojet-General Corp.,** Sacramento, Calif. $1,538,122. Overhaul test and service life analytical program services in support of Titan II propulsion engine systems. Ogden Air Materiel Area, (AFSC), Hill AFB, Utah.

—**North American Aviation,** Anaheim, Calif. $3,324,473. Overhaul and repair of air-to-ground missiles. Oklahoma City Air Materiel Area, (AFLC), Tinker AFB, Okla.

30—**Boeing Co.,** Seattle, Wash. $1,524,482. Production of Minuteman missiles and related equipment. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

—**General Dynamics,** San Diego, Calif. $1,000,000. Services in support of the ballistic vehicle re-entry system. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

31—**Electro-Optical Systems, Inc.,** Pasadena, Calif. $1,218,700. Research and development on an ion engine system. Systems Engineering Group, (AFSC), Aeronautical Systems Div., Wright-Patterson AFB, Ohio.

—**Systems Development Corp.,** Santa Monica, Calif. $4,385,000. Computer programming services for the air defense system. Electronic Systems Div., (AFSC). L. G. Hanscom Field, Mass.

—**Fairchild Hiller Corp.,** Farmingdale, N.Y. $6,341,620. Manufacture of fuel tank modification kits for F–105 aircraft. Sacramento Air Materiel Area, (AFLC), McClellan AFB, Calif.

—**AVCO Corp.,** Wilmington, Mass. $3,500,000. Design, development and fabrication, test and evaluation of the Minuteman IIA re-entry vehicle. Space and Missile Systems Organization, (AFSC), Los Angeles, Calif.

—**McDonnell-Douglas,** Santa Monica, Calif. $28,700,000. C–9A aeromedical evacuation aircraft. Aeronautical Systems Div., (AFSC), Wright-Patterson AFB. Ohio.

OFF-SHORE PROCUREMENT

10—**Shipping & Coal Co.,** Rotterdam, The Netherlands. $23,106,592 and $1,827,152. Coal. Army Procurement Center, Frankfurt, Germany.

Defense Supply Agency Activities Continue Upswing

The Defense Supply Agency (DSA) continues to show increases in most categories of its activities as logistic support of the Military Services reflects the heightened tempo of activities in Southeast Asia during FY 1967.

In procurement, the FY 1967 total amounted to $6.2 billion, a substantial gain over the $5.7 billion of the previous year and more than double the amount of money spent two years ago.

In its first full year of operations, the Defense Contract Administration Services, a major activity of DSA providing unified administration of contracts for supplies and services to the military and various Federal and state agencies, had more than 270,000 prime and secondary contracts valued at $49 billion assigned for full administration.

Procurement Totals for Defense Supply Agency Centers

Activity	FY 1967	FY 1966
	(Millions of dollars)	
Defense Construction Supply Center	670.3	679.1
Defense Electronics Supply Center	280.7	224.1
Defense Fuel Supply Center	1,504.3	1,302.7
Defense General Supply Center	731.7	532.2
Defense Industrial Supply Center	360.4	326.8
Defense Personnel Support Center		
Clothing	1,119.5	1,176.6
Medical	205.5	230.1
Subsistence	1,280.3	1,232.6

Vice Adm. Lyle New President of NSIA

Vice Admiral Joseph M. Lyle, USN (Ret.), former Director of the Defense Supply Agency, became President of the National Security Industrial Association (NSIA) Sept. 28 upon the retirement of the incumbent, Captain Robert N. McFarlane, USN (Ret.).

Admiral Lyle has been serving as Vice President for Operations of NSIA since July 1 when he retired from the U.S. Navy.

A native of Augusta, Ga., Admiral Lyle graduated from the U.S. Naval Academy in 1935.

In 1962 he was appointed Deputy Director of the newly established Defense Supply Agency. He remained in that position until 1964 when he became the agency's Director with three-star rank.

AFMA Re-elects Gen. Bunker President

Lieutenant General William B. Bunker, Deputy Commanding General, Army Materiel Command, has been elected to a second term as National President and Chairman of the Board of the Armed Forces Management Association.

Members of the Board re-elected as directors for the 1967–69 term were: Edmund D. Dwyer, Assistant Commissioner, Federal Supply Service, General Services Administration; Honorable Solis Horwitz, Assistant Secretary of Defense (Administration); Rawlings S. Poole, Office of the Assistant Secretary of Defense (Comptroller); John F. Snyder, Office of the Assistant Secretary of Defense (Comptroller); and Hugh E. Witt, Deputy Assistant Secretary of the Air Force.

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Navy and Commerce Departments Agree on Surface-Effect Ship Plan

The Navy and Department of Commerce have agreed upon a master plan for future development of large, fast, surface-effect ships.

The surface-effect principle offers a potential for greatly improving the speed and efficiency of military and commercial ships. Such vessels utilize a "cushion" or "bubble' of pressurized air to support their weight. Exploitation of this basic principle may make possible a class of high-speed ships capable of speeds three to five times that of the conventional vessels.

An integral part of determining the feasibility of building and operating the large vessels is the design of a small surface-effect ship for test purposes. As a preliminary step in this direction, a fixed-price contract of $125,000 to Aerojet General Corp., El Monte, Calif., has been awarded by the Joint Surface Effect Ship Program Office, located at the Naval Research and Development Center, Carderock, Md.

Similar contracts are also being negotiated with Bell Aerosystems Co., Buffalo, N.Y., and General Dynamics, Electric Boat Division, Groton, Conn., for conceptual and parametric design studies for a high speed surface-effect ship test craft of less than 100 gross tons.

The three contractors are to submit their studies within five months. If the results are promising, a contract for an experimental vessel will probably be awarded.

The master development plan amplifies a joint agreement signed by the two departments in June 1966, establishing a cooperative research program to determine the feasibility of building and operating large, fast, surface-effect ships weighing 4,000 to 5,000 tons and capable of speeds of more than 80 knots.

Objective of the program is to advance the state of technology of surface-effect ships to a point where design parameters and technological problems can be predicted, identified and measured with reasonable confidence. The engineering and technical framework will thus be laid for later and independent development of naval and commercial ships.

Annual Competition for Coast Guard Academy Appointments Set

Annual nationwide competition for appointment to the U.S. Coast Guard Academy will begin with the Dec. 2, 1967, administration of the College Entrance Examination Board Tests.

Appointment to the academy is obtained by competitive examination only; there are no congressional appointments or state quotas. The four-year curriculum leads to a Bachelor of Science degree and commission as ensign in the Coast Guard.

The examination is open to unmarried men, military or civilian, who will have reached their 17th but not their 22nd birthday on July 1, 1968. Applicants must be in good physical condition, and be interested in a career as an officer in the Coast Guard.

Requests for information concerning the examination and the requirements should be addressed to the Director of Admissions, U.S. Coast Guard Academy, New London, Conn. 06320.

All applications should be postmarked not later than Dec. 15, 1967. Arrangements to participate in the examination should be completed by Oct. 28, 1967.

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